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ABSTRACT

This handbook for vocational educators reviews four instructional strategies that may be used in a vocational classroom to accommodate the special needs of the handicapped and/or disadvantaged student. The strategies are task analysis, mapping, flowcharting, and peer tutoring. For each strategy, examples are given that incorporate the three distinct components of competency-based instruction: performance objectives, learning activities, and criterion-referenced activities. An introduction is followed by a description of the project that discusses learning strategies and the use of these strategies to meet individual differences and promote integration. Each of the next four chapters focuses on one of the strategies. The strategy is first described, and examples are given of how the strategy can be used in vocational content areas. Implementation of the strategy and evaluation to determine its effectiveness (student progress) are then discussed. A section on conclusions cites some advantages of the use of the strategy. A list of references is appended. (YLB)

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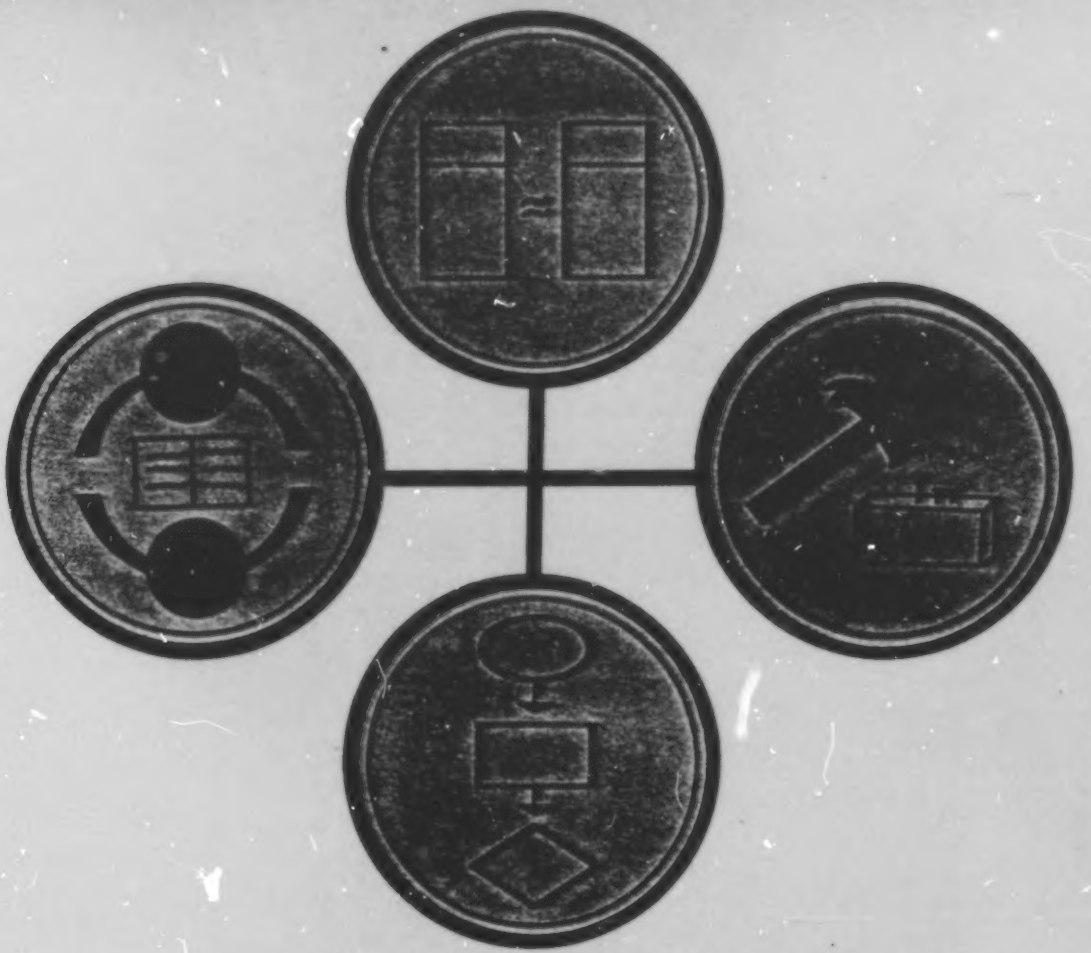

VOCATIONAL SPECIAL NEEDS INSTRUCTIONAL STRATEGIES PROJECT

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INTRODUCTION

Can this student really swallow 30 flies per minute?
Recall with no strings attached?
A directional activity?
Teaching one-on-one?

The answer to all of the above questions is YES! Students with special needs CAN "swallow 30 flies" if the task is broken down into subskills of "one fly per minute" during instructional activities. Students CAN "recall" textbook information if the important concepts are organized graphically. Students CAN be given a step-by-step progression through an activity, using a set of symbols and connecting lines. Students CAN be taught on an individualized basis, using other students in the classroom as peer tutors.

There ARE instructional strategies that CAN improve the quality of vocational instruction. This handbook reviews four of these -- TASK ANALYSIS, MAPPING, FLOW CHARTING, and PEER TUTORING -- and gives examples of how these strategies can be used in vocational content areas.

The strategies do not require a total revision of a vocational teacher's current program. They may, however, require some modification in the vocational class as presently being taught. The strategies have been field tested in Arizona and Texas, with students who have learning disabilities. However, the selection of these four strategies was based upon the premise that they could be utilized with ALL students participating in regular vocational programs.

The four strategies were also selected because of their direct relationship to competency based vocational education. For each of the strategies, examples are given that incorporate the three distinct components of competency based instruction: performance objectives, learning activities, and criterion referenced evaluation.

For example, within a competency based framework of instruction, the TASK ANALYSIS strategy can be used to identify the prerequisite skills needed to accomplish a performance objective. Students who have special needs often lack these prerequisite skills. These skills may need to be taught first or concurrently in the Resource/Remedial Program while the special needs student is enrolled in the vocational program.

The MAPPING strategy can assist the vocational instructor in focusing on key vocational concepts explained in text material, without confusing students who have learning problems with a lot of "nice to know" or extraneous material. There is research that indicates that "reading for the job" requires a different skill than "reading for learning."

Many vocational teachers feel that it is difficult to "reach" all students, especially in a lab situation. A classroom display of a FLOW CHART can be used to depict the steps and give concise directions for a vocational competency.

A PEER TUTORING program could be an excellent activity to accomplish competencies for vocational youth group organizations. This activity could result in improved material for tutoring sessions and could improve the interaction between the students who have special needs and those who do not. Students who have special needs could then be encouraged to join the youth group organization.

The Vocational Special Needs Inservice Program at the University of Arizona welcomes your feedback as you implement these strategies. For further information, contact:

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VOCATIONAL SPECIAL NEEDS INSTRUCTIONAL STRATEGIES PROJECT

A NEED FOR IMPROVED INSTRUCTION

Vocational education for special needs students has received increasing emphasis over the past ten years. The term "special needs" refers to both handicapped and disadvantaged students, implying a need for special instructional services (Brolin & Brolin, 1979). In order to serve this special needs population, vocational educators have been actively seeking appropriate program modifications. A majority of these modifications have been concerned with the adaptation of curriculum materials, student evaluation, and the development of special vocational classrooms. Currently, there is an emphasis on integration of handicapped and disadvantaged students into regular vocational programs.

Tindall, Gugerty, and Crowley (1978) cited four necessary adaptations for the handicapped in vocational programs. These adaptations addressed: (1) employment goals and skills; (2) materials and equipment; (3) teaching methods, techniques, and procedures; and, (4) student evaluation. Among these adaptations, the area of teaching methods, techniques, and procedures has received the least emphasis to date. Too often, career/vocational programs for the handicapped and disadvantaged have featured a separation of the academic program from the vocational program, though operationally they are dependent upon and determine the efficacy of each other (Miller & Schloss, 1982). There is a need to develop an integrated curriculum where academic instruction interfaces with career/vocational training.

One methodology that may address this academic issue in vocational education for special needs students is the utilization of a learning strategies approach to instruction (Alley & Deshler, 1979), especially among students identified as learning disabled or disadvantaged. Effective vocational instruction must not only teach job skills but also provide special needs students with the unique language, meanings, and connotations related to a particular occupational field of study (Woodward & Peters, 1983).

WHAT ARE LEARNING STRATEGIES AND HOW DO THEY WORK?

A review of special education and vocational education literature reveals several methodologies for increasing instructional effectiveness. Task analysis, peer tutoring, and programmed instruction are some of the more widely known instructional techniques among educators. Currently, special educators are investigating other strategies for instruction that utilize the training of thought processes in addition to content. Categorization of material into meaningful units to be learned and an elaboration of the information by the student have been shown to be effective methods for improving recall of information from texts

(Bransford, Stein, Shelton, & Owings, 1980; Johnson & Bos, in press).

Learning strategies are instructional methods that seek to teach thinking or problem solving skills concurrently with information from the content area. These strategies may provide vocational educators with an effective means for integrating special needs students into the regular vocational classroom as well as providing necessary study skills for all students participating in the program.

MEETING INDIVIDUAL DIFFERENCES

In conjunction with these program modifications is the challenge of meeting the individual differences that are often manifested during the teaching process. Individualizing instruction to meet the needs of special needs students may mean systematically varying the objectives, activities, and time factors involved in the instructional process. These subordinate classroom modifications are the basis for the development of an Individualized Vocational Education Plan (IVEP). Each student's ability to meet the requirements of the vocational classroom is assessed and the necessary adaptations are developed. It should be noted here that not all special needs students will require modifications in the areas of activities and time factors.

The Individualized Vocational Education Plan should be used as a tool for accommodating individual differences, not for altering content in the regular vocational classrooms. Variations in vocational content should be assumed in programs developed specifically for various handicapping conditions. However, instructional strategies for both integrated and segregated vocational programs may be modified to assist students in learning classroom content. Variations in instructional formats may in turn reduce the need for other program modifications.

The basic task of performance based education is to discover which instructional strategies will take individual differences into consideration and promote the greatest development of the student (Nystrom, Bayne, & McClellan, 1977). Nystrom et al. (1977) stated that if students are normally distributed with respect to aptitude, but the kind and quality of instruction and the amount of time available for learning are made appropriate to the characteristics and needs of each student, the majority of the students may be expected to achieve mastery of the subject matter. Instructional strategies do require some training, but do not necessarily indicate a total revision of the teaching process or the classroom curriculum. Instructional strategies allow vocational educators to utilize materials and texts with which they are familiar.

INSTRUCTIONAL STRATEGIES PROMOTE INTEGRATION

Accommodations for reading disabled or learning disabled students may be made through appropriate presentation of the material, tutoring, and assignments that incorporate strategies that assist the student in recalling information. Johnson and Bos (in press) demonstrated an

increase in recall with four learning disabled high school boys through the utilization of a mapping strategy with vocational text passages in a resource classroom. Within the public schools, instructional strategies appear to be an economical and viable companion to integration of special needs students into regular vocational programs.

Motivation is the key issue in the development of effective instructional strategies among both special educators and vocational educators. One of the primary conditions of motivation in the individual's belief in the effectiveness of the action he or she is being asked to take (Suchman, 1967). Vocational instructors implementing new instructional strategies need to incorporate frequent measurement of both textbook and activity skills in order to receive direct feedback about the effectiveness of the instructional modifications. Increased feedback about the nature of instruction involves the instructor as a full-time participant in the process of inquiry (Ward & Tikunoff, 1981). Frequent measurement also provides students with information concerning themselves, or their strengths and weaknesses in the classroom. Vocational instructors play an important role in serving special needs students and therefore should be involved in the evaluation of these services (Wentling, 1980).

PURPOSE OF THE PROJECT

The purpose of this project was to examine four instructional strategies that may be utilized in a vocational classroom to accommodate the special needs of the handicapped and/or disadvantaged student. The instructional strategies selected for review were: (1) task analysis, (2) peer tutoring, (3) mapping, and (4) flow charting. Task analysis and peer tutoring are two well known techniques of instruction that are described specifically as they relate to vocational instruction. Mapping and flow charting are two new strategies that may assist vocational educators in working with special needs students in regular vocational programs by focusing upon strategies of THOUGHT in addition to CONTENT.

Each of these instructional strategies applies noncategorically to handicapped populations, which include the learning disabled, behavior disordered, or mildly handicapped, as well as the disadvantaged student. These strategies may also provide assistance across various types of vocational programs. The instructional strategies presented here are only a few of the options available for modification of instruction. THE INHERENT VARIABILITY AMONG STUDENTS WITHIN A CLASSROOM REQUIRES A VARIETY OF TEACHING TECHNIQUES, AND ANY ONE STRATEGY IN ITSELF IS NOT A SOLUTION TO ALL THE LEARNING PROBLEMS FOUND WITHIN A CLASSROOM SETTING.

It is hoped that this information will provide vocational educators with options for instructing special needs students with as little curricular adaptation as possible. Every vocational student must receive an opportunity to work to the best of his or her ability. Successful experiences for special needs students in vocational education programs can result in the preparation of a group of quality employees ready to take their place in society.

• TASK ANALYSIS •

TASK ANALYSIS

This Student Really CAN Swallow Thirty Files Per Minute!

SEQUENTIAL INSTRUCTION OF COMPONENT PARTS

Task analysis is often discussed in special education literature as an important step toward relevant instructional modification. It is an instructional strategy that involves the breakdown of an activity into its component parts. These specific components are then sequentially organized and used in developing a step-by-step approach toward mastery of the complete activity or task. The most difficult part of task analysis is determining what constitutes an appropriate teachable component, one that is neither tediously small nor frustratingly large for the intended learner (Weisgerber, Dahl, & Appleby, 1981).

The task analysis approach to academic instruction is advocated by some learning disabilities educators (Bateman, 1971; Englemann, 1969). Marc Gold (1980) utilized task analysis in research studies on vocational training of mentally retarded persons in sheltered workshops. The ACADEMIC approach to task analysis represents a CONCEPTUAL ANALYSIS of an activity and the VOCATIONAL approach to task analysis represents a MANIPULATIVE BREAKDOWN of a task. BOTH APPROACHES ADDRESS AN INSTRUCTIONAL STRATEGY FOR INCREASING A STUDENT'S PROFICIENCY AT A SPECIFIED TASK OR ACTIVITY.

Research has indicated that the use of the task analysis approach among retarded persons is a successful method of instruction. Marc Gold (1980) developed specific task training techniques for an assembly of a bicycle brake with mentally retarded individuals. However, there is an absence of applied research designed to replicate and validate these findings in workshop programs (Crosson, 1969; Gold, 1970).

Task analysis may provide a methodology whereby students can be integrated into vocational programs. It is an instructional approach that focuses on the capabilities of the handicapped person and on the task that a person with capabilities can perform (Dahl, Appleby, & Lipe, 1978). Development of sequential instructions for hands-on activities may facilitate learning among special needs students.

THE SEVEN COMPONENTS OF TASK ANALYSIS

Cooperation between special educators and vocational educators on the task analysis approach to vocational instruction resulted in the development of the Occupational Cluster Guides at Central Michigan University in 1973. This program guide includes instructional modules for specific activities in various vocational areas. Each module

consists of seven components, each of which addresses specific factors that should be considered when conducting a task analysis, as well as when implementing the procedure as an instructional strategy. An examination of these components provides valuable information on utilizing the task analysis approach to instruction in the vocational classroom.

The seven components of task analysis identified by the Occupational Cluster Guides are: (1) Behavioral Task Skills, (2) Task Related Competencies, (3) Instructional Methods, (4) Instructional Materials, (5) Language of the Task, (6) Quantitative Concepts, and (7) Suggestions.

(1) BEHAVIORAL TASK SKILLS. This component involves the actual breakdown of the task into SUBSKILLS that are then listed as PERFORMANCE OBJECTIVES that the student must demonstrate to be considered proficient at the task. Each of these performance objectives may serve as a criterion for measurement as the student advances through the objectives toward mastery of the task. It is important that the instructor coordinate the performance objectives with the student's ability level.

Example: The student will demonstrate how to grade a seam.

(2) TASK RELATED COMPETENCIES. Each performance objective may require PREREQUISITE SKILLS necessary to perform the task. These skills must be identified to insure achievement of the performance objectives and to assist the student in obtaining these skills. Prerequisite skills may be identified as background knowledge, dexterity, or physical capacities. Prerequisite skills or competencies should not be presented as barriers to vocational training; rather, such deficiencies can be accommodated through adequate assessment and planning.

Example: A student may have difficulty discriminating between his or her left and right hand. Simple reminders such as rings or watches may be used to modify this problem.

(3) INSTRUCTIONAL METHODS. One of the most important components of a task analysis is incorporating appropriate instructional techniques for teaching performance objectives designated in the behavioral task skills. It involves selecting an instructional technique that addresses the individual student's learning style. Instructional techniques may include various forms of repetition exercises, pictorial guides, supportive academic instruction, or a combination of these various techniques. Information concerning the appropriate instructional techniques can usually be obtained from the special education instructor and other support service staff.

Example: A student performs better when an activity is first demonstrated and then repeated verbally to the instructor before beginning the task.

(4) INSTRUCTIONAL MATERIALS. Activities or tasks within a vocational classroom require that a student have available the necessary tools.

equipment, and materials required to complete a task. This component of task analysis is a major key to successful completion of the task. If a student is unable to recognize or use the tools and equipment necessary for task assembly, it may often be reflected in poor attention to the task and extended time periods in which to complete the task. The utilization of multi-media instructional materials such as filmstrips, and minor accommodations in lab set-ups, may facilitate orientation to the task.

Example: The use of long, descriptive textual narratives during labs may be adapted by underlining the key terms and labeling tools and materials.

(5) LANGUAGE OF THE TASK. In every area of vocational education there is an occupation-related vocabulary. It is necessary that students recognize these key words and understand their meaning in relation to the task. Therefore, it is important that these key occupational terms be identified and incorporated in the instructional process.

Example: The terms "plumb" and "square" in the construction area.

(6) QUANTITATIVE CONCEPTS. In laboratory settings time, size, weight, height, and other measurement concepts are often associated with a task. It may also be necessary for students to use mathematical functions such as addition and multiplication in order to complete a task successfully. Knowledge of strengths and weaknesses in mathematics can alert vocational educators to seek the assistance of a resource teacher for remedial instruction or to identify modifications that may be implemented, such as provision of a small hand calculator to assist in mathematical functions. It should be noted here that the usefulness of a basic academic skill such as math may affect a student's acquisition and retention of a vocational skill.

Example: A student may not have attained competency in adding and subtracting the fractions necessary to complete a cooking assignment. Special educators may be able to assist the student by developing a supplement sheet on fraction adding for labs.

(7) SUGGESTIONS. During the course of task analysis, other adaptations or modifications may be identified by the vocational instructor. Specific notes made by the instructor may assist in future analysis of the task or instructional techniques.

Once developed, these task analysis components can form an integrated instructional approach that is beneficial to both the student and the instructor. Figure 1 shows an example of these components as they may be utilized in a carpentry program. The example relates the instructional tasks that could be taught cooperatively by the vocational and special education teachers or other support personnel in the school.

TASK ANALYSIS COMPONENTS

Instructional Objective: The student will assist in framing and securing partition intersections.

Behavioral Task Skill	Related Competencies	Instructional Methods	Materials	Language of the Task	Quantitative Concepts	Suggestions
(1) Measure and cut partition frame members	Measurement skills Identifies tools Demonstrates sawing procedures	Resource teacher Pictorial handout Peer tutoring--hands-on Demonstration	Measuring tape Tools for task Lumber	2 X 4 stud Partition	¼ inch, ½ inch, etc.	Acknowledge need for prevocational skills with resource teacher
(2) Lay out frame members	Spatial abilities Ability to follow a diagram	Resource teacher Worksheets on copying forms Identification of doors and windows from drawings Demonstration Peer tutoring Use of small scale models	Physical prompts (color coding, etc.) if necessary Worksheets, text Frame members Model materials	Blueprints Layout		Allow more instruction time
(3) Nail frame members	Demonstrates nailing procedure	Identification of 8d, 16d, and 20d nails Demonstration Hands-on experience	Nails Frame members Tools		8d, 16d, and 20d nails	
(4) Position the partition	Physical capacity Communication skills	Resource teacher Discussion and text Field trip Safety and cooperation via demonstration/role playing	Medical information Text Field trip forms, etc.	Intersection points Exterior Extra stud Blocking		Develop ways to generate more experience
(5) Concepts of plumb and square	Visual acuity Communication skills	Discussion Text assignment Demonstration Peer tutoring--hands-on	Text, level Plumb line, square Demonstration materials	Plumb Square Plumb line Level	90-degree angles	See resource teacher for ideas on this concept
(6) Nail partition in place	Physical capacity Communication skills	Demonstration Field trip Hands-on experience	Materials for demonstration	Review partition		Allow for different rates of learning among students

Figure 1. Task analysis of framing and securing partition intersections.

Implementation of Task Analysis: A Cooperative Effort

A review of the sample task analysis developed for framing and securing partition intersections shown in Figure 1 demonstrates the necessity for cooperative planning between vocational and special educators and support staff. This cooperative effort during task analysis is reflected in decisions regarding the development of educational objectives, task analysis components, teaching methods and materials, and follow-up procedures.

EDUCATIONAL OBJECTIVES

The goal of acquired knowledge is inherent in both vocational and special education. Each discipline has an expertise that must be shared during the implementation process. The development of a hierarchy of competencies within a vocational program is the responsibility of the vocational educator. The process of developing a continuum of performance objectives and coordinating instructional activities in order to attain the competencies is the responsibility of both the vocational educator and the special educator or support staff.

The development of competencies and performance objectives for a special needs student entering a vocational classroom should be discussed during the Individualized Vocational Education Plan (IVEP) staffing. Activities or tasks that may require instruction utilizing the task analysis strategy should be identified.

FORMULATION OF A TASK ANALYSIS

A coordinated effort between vocational and special education/supportive services is also necessary during the development of a task analysis. The vocational instructor is knowledgeable about the various task subskills necessary to complete the task and can provide the basic information utilized in developing a task analysis.

Information regarding the presence or absence of related competencies, such as mathematical skills, may be obtained from the special educator and support staff, and if necessary supplemental tutoring sessions within the special education or remedial classroom can be developed. The special education and remedial instructors are also trained to utilize various instructional techniques that can be related to vocational instruction to assist vocational teachers in maximizing their instructional efforts.

TEACHING METHODS AND MATERIALS

The primary responsibility of instruction during task analysis in the vocational classroom rests with the vocational instructor. Adequate preparation is a significant factor in developing daily or weekly instructional plans. This process clarifies and organizes daily classroom activities into sequential instruction. Supplementary test assignments, worksheets, and laboratory materials must be readily available. These preparations are often already stipulated within the task analysis if it is developed correctly (see Figure 1). Adequate planning often allows flexibility within the classroom setting on such variables as time factors and instruction on a one-to-one basis.

FOLLOW-UP PROCEDURES

The special educator and support staff must continue to assist the vocational instructor by obtaining feedback from the vocational instructor concerning the effectiveness of the task analysis strategy. Further modifications can be developed, if necessary, and implemented at an appropriate time in order to facilitate attainment of the performance objectives listed within the task analysis.

Arrangements should be made for establishing regular meetings between the vocational instructor, special educator/support staff, and if necessary the special needs student, to establish a working rapport. These cross-disciplinary meetings should avoid focusing on territorial responsibilities or concentrating on the weaknesses observed in the student.

Positive interaction among educators who wish to provide adequate and appropriate educational opportunities for a student can facilitate achievement within a classroom. It may also be noted that informal communications in hallways or cafeterias between instructors can assist in monitoring instructional procedures on a daily basis. Figure 2 shows a diagrammatic representation for implementing task analysis for special needs students within a vocational classroom.

Evaluation of Task Analysis

ADVANTAGES OF THE EVALUATION PROCESS

Evaluation is a process of determining the effectiveness of an instructional strategy. It reflects the totality of the instructional procedure so that strengths and weaknesses can be identified in order to facilitate strategy usefulness. The most qualified individuals for the evaluation process are the instructors and students who actively initiate and utilize the instructional strategy within the classroom.

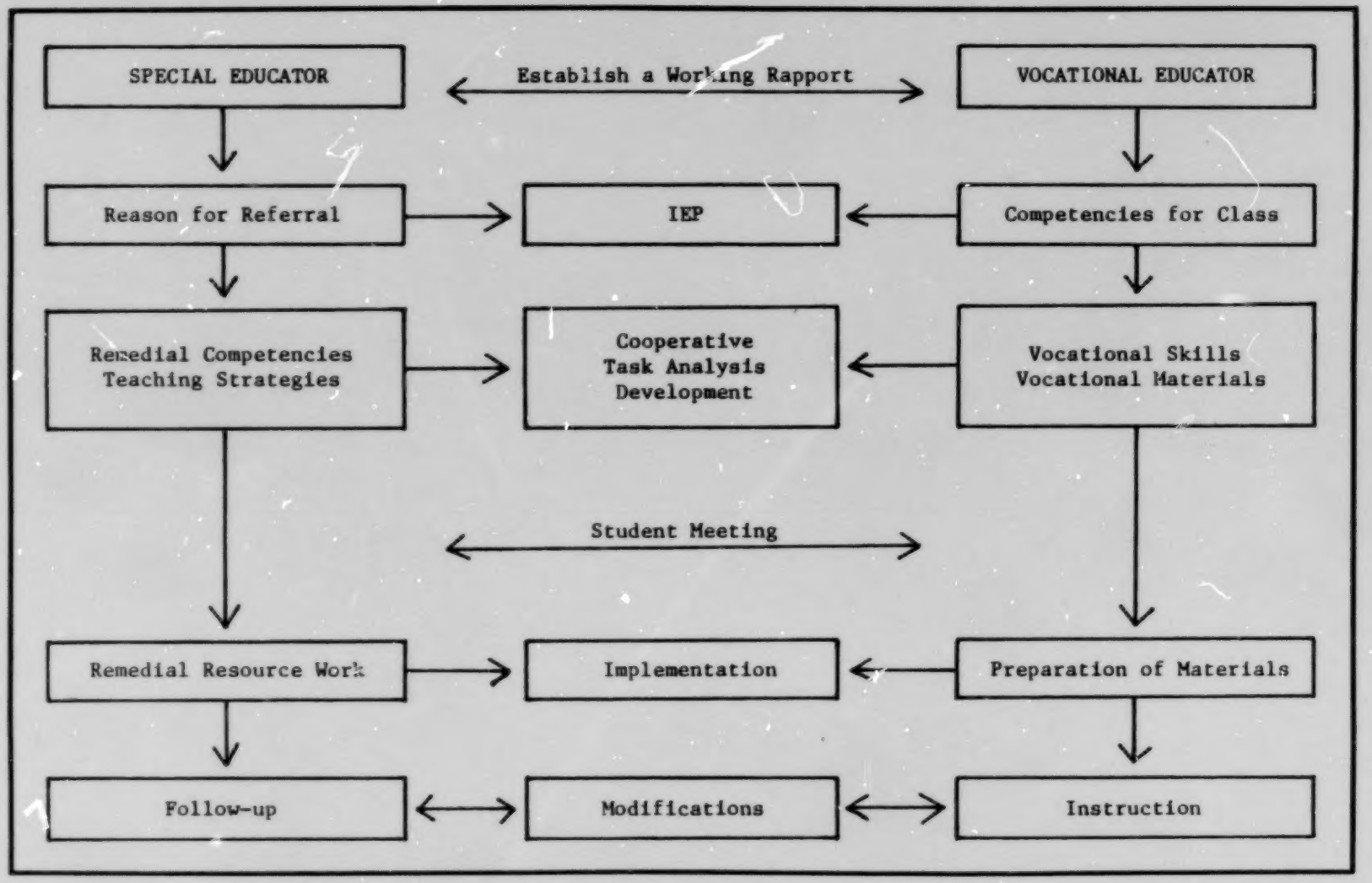


Figure 2. Implementation of task analysis instruction.

The utilization of behavioral task skills in task analysis allows for periodic evaluations of the instructional strategy during implementation. Each designated subskill is evaluated prior to the initiation of the next behavioral task skill. One advantage of this evaluation process is the ability to pinpoint weaknesses within each subskill that may affect completion of the task. Barriers to achieving proficiency on the task may be dealt with individually, rather than assuming that a student is unable to perform the task as a whole.

Another advantage of task analysis evaluation is the process of continuous feedback received through a series of periodic evaluations. Continuous feedback allows instructors to alter instructional techniques at an opportune time in order to avoid lengthy instructional time factors or frustration to both teacher and student.

STRATEGIES FOR EVALUATING TASK ANALYSIS INSTRUCTION

Subskill evaluations may be conducted in a variety of ways, depending upon specific performance objectives. Review worksheets, short oral or written exams, student demonstrations, or observational assessments are just a few of the evaluation methods that may be used by instructors. It is important, however, that the selected evaluation method correspond with the instructional technique utilized during training. For example, if a special needs student has completed a performance objective that requires threading a sewing machine, test or evaluate this objective through demonstration or an oral review quiz, not a true/false exam concerning the correct threading procedure. Hands-on proficiency is mandatory for this performance objective. Written exams may be used for evaluations concerning vocational vocabulary or textbook assignments. Evaluations should not be lengthy nor address other subskills not yet introduced to the student. A sample evaluation for task analysis is provided in Figure 3.

A series of daily evaluations or reviews, in addition to a task completion evaluation, provides the vocational instructor with a sound basis for accurate grading of the special needs student based upon ability level. Individual school grading policies and instructor preferences in evaluating students may be incorporated within this evaluation process.

Students may become responsible for some of these periodic evaluations, which may increase motivation through self-initiated feedback. Cooperative student and teacher evaluations can increase communication, interest, and active participation within the vocational classroom.

Objective measures are an important source of information during the evaluation process. Additional subjective evaluations may also provide valuable information about an instructional strategy. Observable changes in attitude, promptness, motivation, and general classroom conduct are variables that may positively or negatively affect attainment of the performance objectives. A Student Behavior Checklist is presented in Figure 4. The behaviors listed there were selected because of their correlation with work adjustment behaviors evaluated by job coordinators.

EVALUATION: FRAMING AND SECURING PARTITION INTERSECTIONS

I. Measuring and Cutting Partition Frame Members

Subskill	Evaluation Method	Evaluator	Date
Measurement skills			
Tool identification			
Sawing procedure			
Vocabulary of task			

Behavioral Task Skill No. 1 _____
date

II. Laying Out Frame Members

Subskill	Evaluation Method	Evaluator	Date
Follows a diagram			
Identify doors, windows			
Blueprints (if necessary)			
Vocabulary of task			

Behavioral Task Skill No. 2 _____
date

III. Positioning of the Frame

Subskill	Evaluation Method	Evaluator	Date
Communication skill			
Safety			
Vocabulary			

Behavioral Task Skill No. 3 _____
date

IV. Concept of Plumb and Square

Subskill	Evaluation Method	Evaluator	Date
Vocabulary of task			
Text assignment			
90-degree angles			

Behavioral Task Skill No. 4 _____
date

V. Nailing Partition in Place

Behavioral Task Skill No. 5 _____

COMMENTS:

Figure 3. Evaluation of task analysis instruction.

Please rate the student's behavior on the following items as to whether it occurs frequently (5), sometimes (3), rarely (0), or somewhere between.

	BEHAVIOR	RATING					
1.	Works without supervision	5	4	3	2	1	0
2.	Asks for more work	5	4	3	2	1	0
3.	Easily discouraged	5	4	3	2	1	0
4.	Clockwatcher	5	4	3	2	1	0
5.	Considerate of others	5	4	3	2	1	0
6.	Complains	5	4	3	2	1	0
7.	Punctual	5	4	3	2	1	0
8.	Interrupts others	5	4	3	2	1	0
9.	Contributes to class discussions	5	4	3	2	1	0
10.	Is avoided by others	5	4	3	2	1	0
11.	Tires quickly	5	4	3	2	1	0
12.	Is prepared for class	5	4	3	2	1	0
13.	Needs constant reinstruction	5	4	3	2	1	0
14.	Uses alibis	5	4	3	2	1	0
15.	Will attempt all tasks	5	4	3	2	1	0
16.	Daydreams	5	4	3	2	1	0
17.	Seeks help when necessary	5	4	3	2	1	0
18.	Uncooperative	5	4	3	2	1	0
19.	Asks questions when necessary	5	4	3	2	1	0
20.	Gets upset easily	5	4	3	2	1	0
21.	Follows directions	5	4	3	2	1	0
22.	Wastes time	5	4	3	2	1	0
23.	Accepts constructive criticism	5	4	3	2	1	0
24.	Leaves tasks unfinished	5	4	3	2	1	0
25.	Requires less discipline	5	4	3	2	1	0
26.	Is distracted easily	5	4	3	2	1	0
27.	Carries share of joint tasks	5	4	3	2	1	0
28.	Attendance	5	4	3	2	1	0

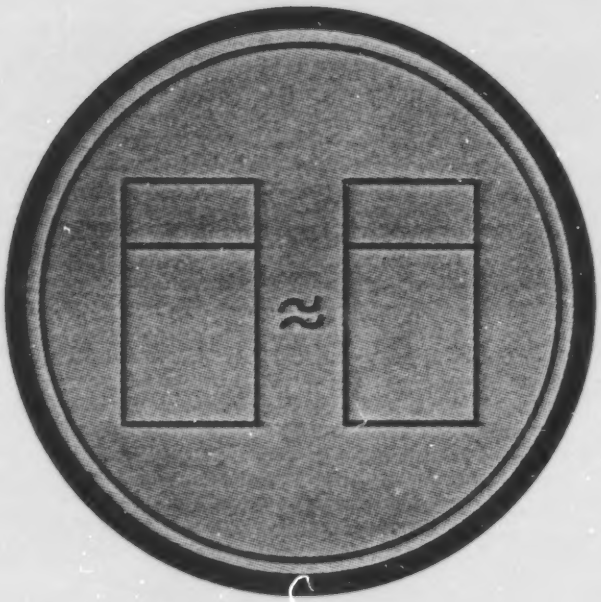
Adapted from: Daniels, L. R., & Stewart, J. A. A vocational adjustment rating scale for the mentally retarded. Training School Bulletin, 1969, 68, 10-14.

Figure 4. Student behavior checklist.

Conclusions

Hersen and Barlow (1978) define task analysis as the breaking down of an individual task into a series of instructional steps. These negotiable steps enable the individual to perform a complex task or competency through a sequential learning process. They further state that learning through a step-by-step procedure is critical to both school and employment success.

Task analysis as an instructional strategy may enable some special needs students to take part and learn from vocational activities previously assumed by educators to be too complicated for their ability levels. Perhaps we should all recall the first time we attempted to perform a complex task such as driving, swimming, or assembling a tricycle on Christmas eve. A series of instructional steps assisted us in mastering these tasks and rewarded us with a feeling of achievement. Special needs students should have that same opportunity for satisfaction in a job well done.



•MAPPING•

MAPPING

Recall With No Strings Attached

A READING STRATEGY

Acquiring information from texts requires a special type of reading that emphasizes comprehension and recall. Special needs students hindered by substandard reading levels and lack of textbook skills do not usually gain from vocational information located in texts. This is often reflected in below average achievement scores within the classroom and may even interfere with classroom activities.

Training students to locate information and utilize textbooks is the responsibility of all educators. However, most classroom instructors assume that adolescent students have already acquired the basic study skills necessary for text use within a classroom. Research indicates that a majority of special needs students do not possess the necessary skills for gaining information from texts (Brown, Campione, & Day, 1980; Torgesen, 1980). Instructional strategies that address study skill deficits in addition to classroom content may provide educators with a valuable alternative for promoting achievement among their students.

One such alternative instructional strategy was developed by Armbruster and Anderson (1980). Mapping is a reading strategy that emphasizes comprehension and recall of text information. It is a technique that seeks to convey the meaning of important relationships among concepts in text by re-representing them in an interconnected diagram.

CATEGORIZING WRITTEN MATERIAL

The rationale for the mapping technique was provided by research in the areas of reading and cognitive psychology. Reading research indicates that efficient readers approach a reading task in an active, strategic, and flexible manner (Wong, 1978). Cognitive research suggests that categorization of material into meaningful units, rather than individual items, facilitates recall (Frase, 1969).

Studies examining the effectiveness of the mapping strategy also demonstrate improved recall of reading material. Armbruster and Anderson (1980) found that middle school students showed an increase in recalling idea units from text passages following mapping strategy training. Johnson and Bos (in press) modified the mapping strategy by focusing upon the categorization concept for training learning disabled adolescents in a resource classroom setting. A series of vocational text passages concerning career opportunities and job information were used in the study. The results demonstrated an increase in recall among all subjects

participating in the study. One positive aspect of this study was that mapping strategy training for all students was completed within three to four sessions of approximately twenty minutes each. It appears that the mapping strategy is a feasible alternative for instruction among special needs adolescents.

The mapping strategy is used in conjunction with the classroom text. It seeks to have students reorganize important text information on a single sheet of paper for study purposes. Textbooks that utilize headings to call attention to key concepts, italicized vocabulary terms, and marginal comments or illustrations provide an excellent structure for the mapping technique (see Figure 5). One of the advantages of this process is that it requires students to interact with the textbook and provides instructors with an assignment option.

MAPPING STRATEGY TRAINING

The modified mapping strategy consists of a diagram that is structured to include a main topic, a small number of categories for organizing information, and a varied number of attributes or facts to be placed under each category. Uniform boxes are not essential in the mapping procedure. During field testing of the mapping strategy, it was noted that the correct placement or organization of the information was more important than the quality of the map structure. It was observed that students modified the map structure and used abbreviations in the map sections after becoming familiar with the strategy in order to economize their time.

It should also be noted that a consistent number of categories and attributes during the initial utilization of mapping assisted students in learning the strategy. For example, a map that had two categories one day and five categories the second day confused the students in category selection. The authors suggest the use of three or four categories within each map.

It is best to train students in utilization of the mapping strategy with the use of previously developed training passages taken from text. Training passages are 140-160 word samples of text. A set of twelve training passages is sufficient for the training procedure. Figure 6 shows a sample training passage and Figure 7 shows the corresponding student-developed map.

STEP 1: MAIN TOPIC. A set of three training passages is presented to the students. After reading the first training passage, the students are asked to select the main topic of the passage. Following a short discussion about the main topic concept, the instructor draws a main topic section of a map on the board. The students are then instructed to draw a main topic section of a map on a sheet of paper and place the selected main topic within that topic section. This procedure is independently repeated for the remaining two training passages. Each student now has the beginning of a map for each of the three training passages.

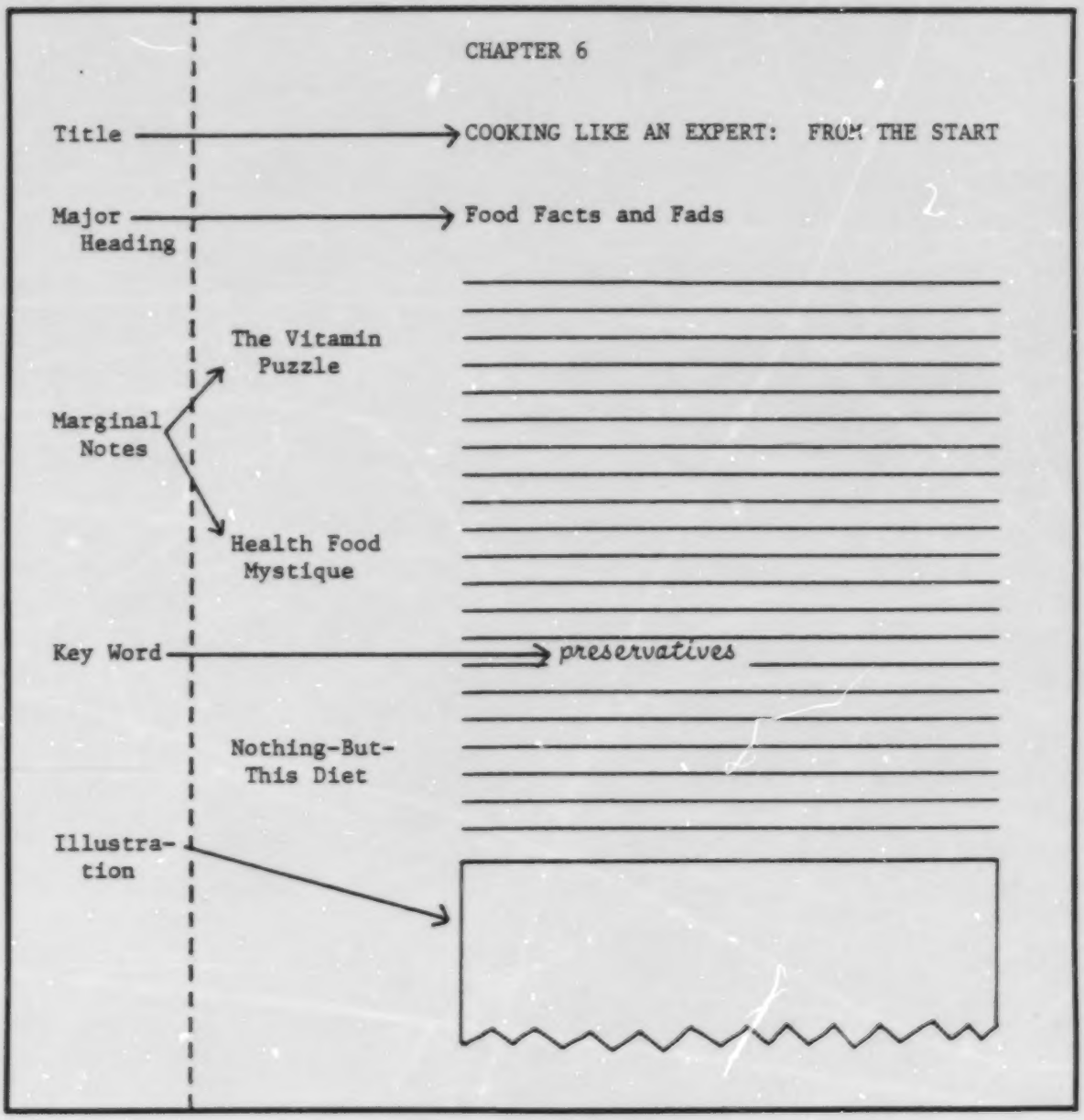


Figure 5. Organization of textbook chapters.

SHEET METAL WORKER

A sheet metal worker works on such things as air conditioning and heating ducts, and other things made out of lightweight metals. A sheet metal worker may work in the shop or go out to new homes and buildings to put in the metal products.

There are many products or things a sheet metal worker will make while in the metal shop. Here are some of their products. They will build shelves, control boxes, and exhaust stacks. Heating ducts and air conditioning ducts are also made in sheet metal shops by sheet metal workers.

The job duties of a sheet metal worker will change if you work in the shop or out in the buildings as an installer. Sheet metal workers cut metal and use different kinds of power tools. They will also bend metals and put together the metal parts. They put the parts of metal together by using welding torches. These job duties are for sheet metal workers who do their job in the metal shop.

Some high school classes can help you to become a sheet metal worker. Metal Shop, Wood Shop, and Shop Math can all help you with job skills. If your high school offers classes in Welding or Drafting, you should be sure to enroll in these classes.

Most employers will only hire sheet metal workers who have a high school diploma. This semi-skilled job can help you earn good money.

Figure 6. Sample text passage for mapping strategy training (sheet metal worker).

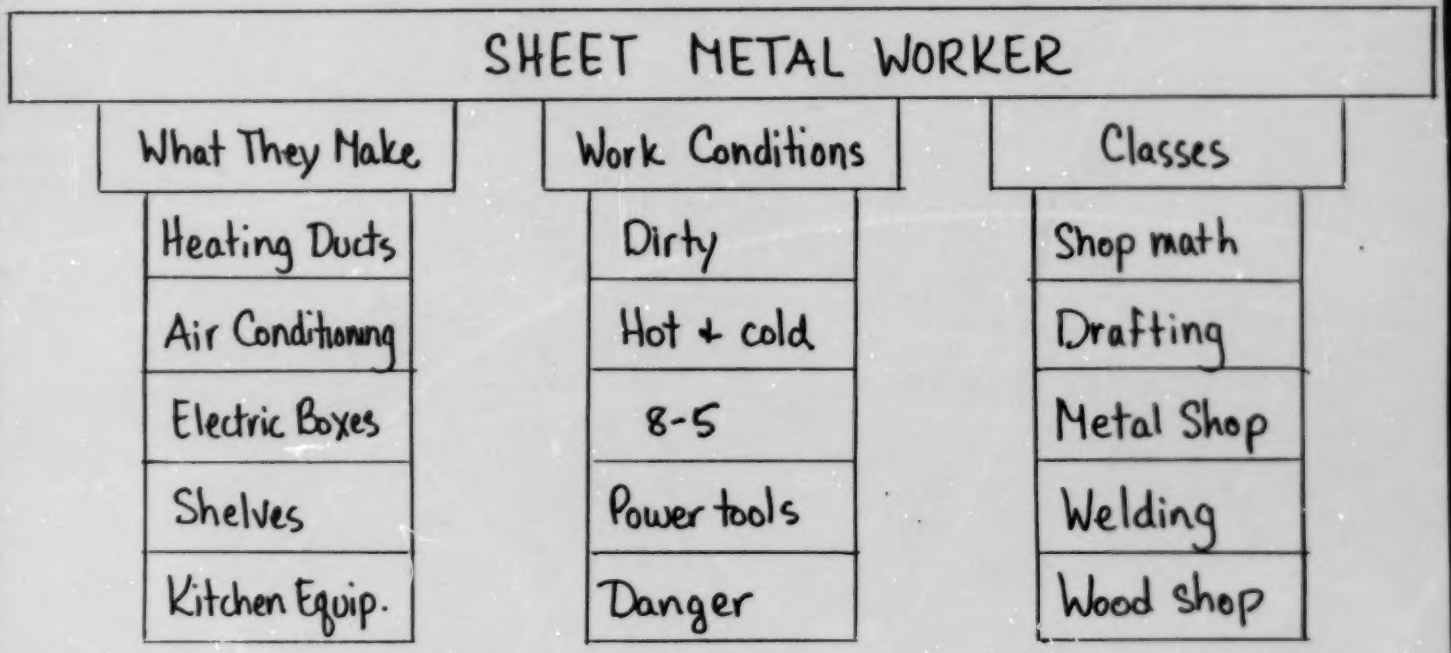


Figure 7. Student map of sample text passage (sheet metal worker).

STEP 2: CATEGORIES. The three training passages and incomplete maps developed during instruction of the main topic are returned to the students. The instructor discusses the category concept and assists the students in locating and underlining the categories found within the first training passage. A main topic section of a map and the category boxes are drawn on the board by the instructor, and the correct information is placed within the map. After copying this demonstration map, the students complete the category sections of the incomplete maps for the remaining two training passages.

STEP 3: CATEGORY ATTRIBUTES. The three training passages and the maps developed during the first two training steps are returned to the students. Using the first training passage, students are assisted in locating and underlining the category attributes found within the training passage. Following a demonstration of map drawing, including the attribute section, the students place the underlined attributes of the first training passage into the corresponding map from Step 2. This procedure is repeated independently for the remaining two training passages. At the completion of this training step, each student will have drawn three complete maps, one for each of the training passages.

STEP 4: POSTTEST. A posttest should be administered to all students who received mapping strategy training in order to measure individual competency in use of the strategy. Each student is presented with a new text passage and asked to draw a map for that passage. If a student does not demonstrate proficiency in the mapping procedure, additional training passages may be used to extend the training period.

On the following pages, Figure 8 is a sample of simulated text passages and Figure 9 is the map that was constructed from the textual information.

Implementation of the Mapping Strategy

The training process described earlier is the first step that must be taken during implementation of the mapping strategy. This training process may be done individually or with groups. The instructor who will be using the strategy is primarily responsible for strategy training.

Assimilation of the mapping strategy into the classroom routine is also at the discretion of the instructor. UTILIZATION OF THE MAPPING STRATEGY WILL PROBABLY OCCUR IN CONJUNCTION WITH TEXT ASSIGNMENTS OR LESSONS THAT LEND THEMSELVES TO THE CATEGORIZATION CONCEPT.

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Figure 9. Sample text passage for mapping strategy strategy training (carpets and rugs).

(Taken from: Starting Out: How to get the most out of your home, furnishings, food, money. Golden Press, 1975.)

HOMING IN ON CARPETS AND RUGS

Here's a brief review of today's all-star cast of carpets and rugs. Use this as general background knowledge—but don't forget to check with your salesman about new developments and refinements in the field. Manufacturers are working constantly to improve their products and bright newcomers appear on the scene regularly. Another happy note: The range available is wide enough to cover even tight-budget buying!

For a real spread of color and comfort: wall-to-wall. Here, the carpeting is custom cut to snug up right to the walls; then it's secured in place. Advantages: a smooth, draft-free feel underfoot, a unified look *and* only one kind of surface to clean. This unbroken stretch of color and texture will make a small room look larger, too. It's the most expensive carpeting to lay and to pick up, however. You also face the possibility that the landlord or incoming tenant will consider it a "permanent improvement" and insist that you leave it behind when you move.

Dollar-saving alternative: foam-backed carpeting. This is like regular broadloom, but it features a high-density foam rubber or vinyl foam backing so (if you're at all handy) you can cut it and lay it yourself. It gives you a saving on installation costs and it's easy to pick up and recut when you move.

Mobile carpeting: the room-size rug. Carpeting is cut to rug size and bound all 'round. This usually leaves a border of bare floor showing—nice if your floors are in good condition. Moving? You just roll it up as you would a regular rug and into the truck it goes. Readily available in standard sizes like 5x7′, 9x12′, 12x15′,

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(continued)

12x18'—or you can special-order your choices cut from the roll and bound. Two great advantages: They can be turned to distribute the wear evenly and they can be sent out for cleaning.

Put carpet tiles down plain or in a pattern. These handy squares of carpeting let you plan your own design. They're easy to work with if you plan to do-it-yourself and they come with a wide range of backings. Some you lay without an adhesive or with double-faced tape. Some are self stick or have a release adhesive —so they go down and come up easily. One big plus here: You can replace individual squares that get worn or badly soiled.

The "put me anywhere" type: indoor-outdoor carpeting. It's a real toughie that weathers rain and sun on your porch or patio, can also take the wear and tear of kitchen, bathroom or basement. No scrubbing or waxing with this one. Stains—even hot grease—just wipe away! And don't think it's drab because it's so practical. Quite the contrary—it comes in a kaleidoscope of colors. Warning: There's also a wide variance in quality and performance between individual brands—so ask before you buy!

How To Figure It Up: Quantity And Cost

A little simple arithmetic will show you how much carpeting you'll need for any room. Most carpeting is sold by the square yard, and here's how to figure that out:

1. Measure the length and the width of the room, in feet.
2. Multiply the length by the width, still in feet.
3. Divide this figure by nine to turn feet into square yards.

Example:
For a 12x15' room—
12x15'=180'; 180÷9=20 square yards

Usually, carpeting comes in 12- or 15-foot widths and some styles are also available in 9- or 18-foot widths. This means that you can choose carpeting in a width that will adapt to the width of the room, with a minimum of cutting or wastage. Where exact fit is most important—in wall-to-wall installations—the store you buy from will measure your room for you, and figure out the cost of installation and padding as well. Carpeting you buy already cut and bound as a room-size rug is usually priced as a unit rather than by the square yard.

Carpeting comes in three grades and price ranges: economy grade, medium grade and top quality. When you're considering which to buy, don't judge solely on the basis of price, however. Pattern and color, the durability of the carpeting, the reputation of both the manufacturer and the retail store you're buying from —these are all factors to be considered, too.

(Fig. 8 continued)

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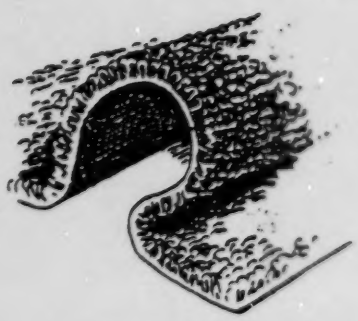
Some manufacturers are even producing the same texture and color carpeting in all of the three grades. You can get an "all together" look at minimum cost by using the economy grade in light traffic areas like bedrooms or guest rooms, the medium grade in the living room and dining room and the top grade in heavy traffic areas like a hallway, stairs or living room (if your living room tends to take a lot of to and fro movement). This across-the-board look can really help a small apartment or house to look larger than it is. It also helps achieve the unified look that ultra-sophisticated contemporary aims for. Practically speaking, the denser the pile the longer the carpet will keep its looks and feeling of luxury. Remember, too, that *both* very light and very dark shades show dirt quickly. To cut down on cleaning, head for medium-solid tones or a tweedy or many-color pattern. Texture also affects the practicality of carpeting, with the top-duty rating going to twists, loops, shags and textured types. With these, however, you should consider their cleaning practicality as well as their wear. See page 90 for a complete rundown on textures. A general rule of-thumb: Skip the economy grade if you're going to the expense of installing wall-to-wall. If your rooms boast finished floors, choose a good room-size rug instead that can be turned to equalize wear. If your rooms feature subflooring only, then you'll need to get wall-to-wall carpeting—even if you'd prefer something else.

How To Be A Quality-Counter

If you're thinking about buying carpeting, make these quick quality-checks first:

☐ The denser the pile the better the wear. In high-density pile, the fibers are closely packed to form a tight, cohesive mass. The height of the pile alone has little to do with carpet wear—it's purely a matter of what you think looks good. To judge pile density, bend the carpeting back on itself. If the backing shows up clearly between the rows of pile, the carpeting is probably not dense enough to wear well. Be particularly careful with low- to medium-priced shags. Many of these have a self-colored backing which tends to conceal gaps—these can be the result of skimpy construction.



Tightly packed loops are an indication of high quality in carpeting.

☐ A good backing is important to the life of the carpet, too. The backing can be made of jute, cotton, raft cord or polypropylene. It's there to provide a firm foundation and prevent stretching, shrinking, buckling. All tufted and knitted carpets, and many woven types as well, have an added coating of latex on the backing. To check for this, run your hand across the backing. If it feels "rubbery," it's latex coated. Also check the label to see what the backing is made from.

(Fig. 3 continued)

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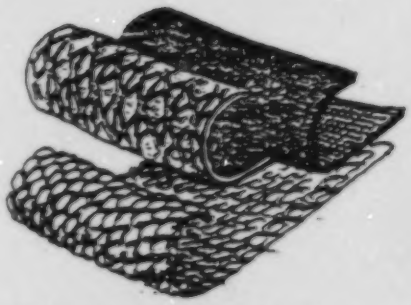
☐ Special note for tufted carpeting: Most good-quality tufted carpets have an extra layer of backing-fabric laminated to the primary backing to lend greater strength and longer life. Tufting is the most widely used construction method today, so be sure to ask about double-backing when you're checking carpeting. (See chart on page 89 for description of tufting and other carpet construction terms.) Don't feel self-conscious about all this checking. Any good store wants you to be satisfied.



Types of carpet padding (from top to bottom): felted; felted with rubber coating; foam rubber.

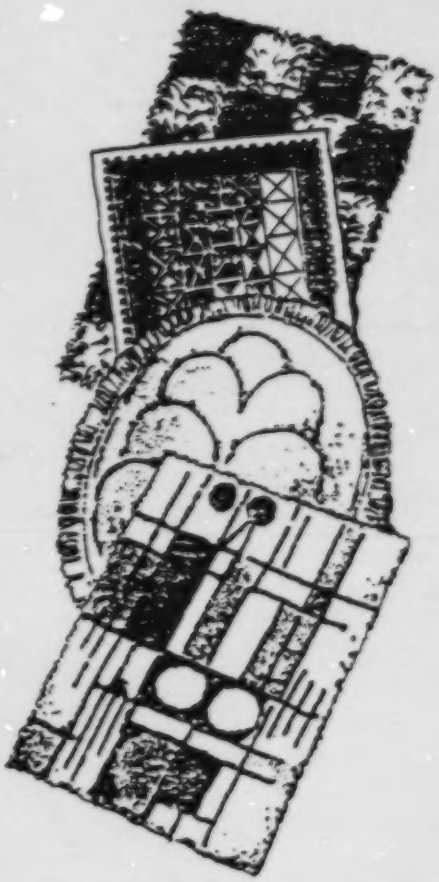
These Undercover Agents Help Protect Carpets And Rugs

Not just a "nice extra," not a "let's do without it" . . . good-quality padding, backing or underlaying can add years to a carpet's or rug's life-span. With wall-to-wall, it's essential—and it's almost as important for room-size or area rugs. What does it do? It adds softness and comfort, helps absorb the shock and pulling of hard leather heels and soles. Choose from three types: felted, usually made of hair or hair and jute; foam or sponge rubber; or felted hair with a rubber coating. Felt gives a firmer feel, sponge is bouncier underfoot, and rubber-coated hair combines the advantages of both. It's not good business to lay new carpeting on old padding, so count up the cost of carpeting *and* backing when you're figuring costs.

For good quality, choose a 40-ounce felted padding or a ⅜-inch-thick sponge cushioning. These are suitable for normal home use. While we're on the subject: If you go in for casual cotton throw rugs, be sure you anchor them in some way! Your rooms can turn into a skating rink otherwise. Thin sheets of rubber backing can be ordered cut to size, or you can use strips of the double-faced backing tape that's available in most rug or hardware stores. Both work well.

FYI: A Résumé Of Rugs

How is a rug different from carpeting? Usually, a rug is made as a single design, complete within its own borders. Carpeting is manufactured in continuing lengths which are cut into rolls. From ancient times on, rugs have been prized as works of art and today rugs from every part of the world are available.



Variety of area rugs.

Area rugs, most popular and most versatile, come in all colors, patterns and sizes. Real or fake fur, wool, cotton, nylon—the whole range of fibers is there to choose from. Enjoy a sleek Scandinavian design, Mediterranean with a touch of Marrakesh, traditional Navajo or Hopi—the choice is almost endless. These small-to-middling rugs are attractive against wooden floors, doubly dramatic shown off against vinyls, tiles or brick. Some serve as handsome wall hangings. Most live a long life, going

(Fig. 3 continued)

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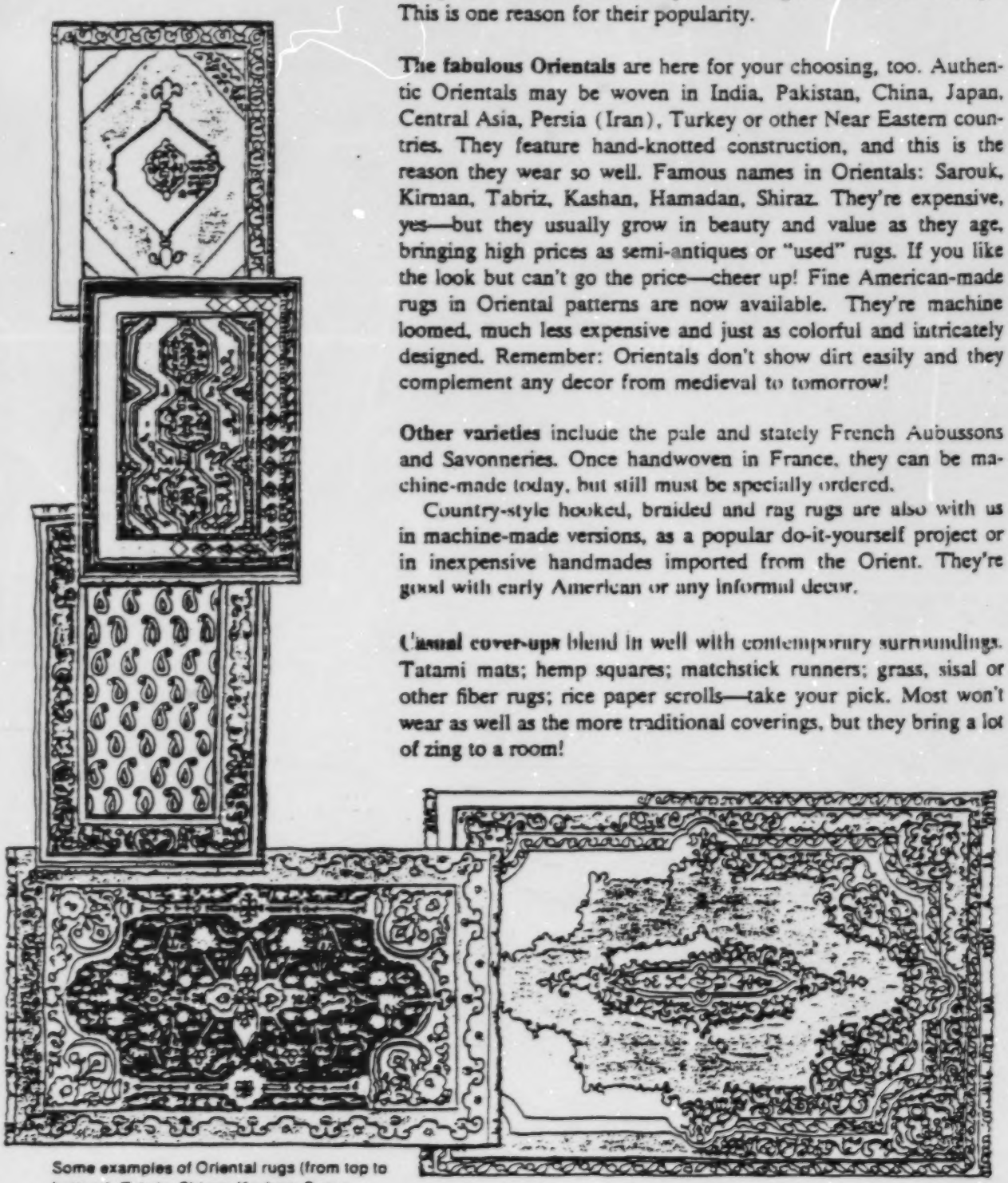
easily from room to room as your home grows in size and scope. This is one reason for their popularity.

The fabulous Orientals are here for your choosing, too. Authentic Orientals may be woven in India, Pakistan, China, Japan, Central Asia, Persia (Iran), Turkey or other Near Eastern countries. They feature hand-knotted construction, and this is the reason they wear so well. Famous names in Orientals: Sarouk, Kirman, Tabriz, Kashan, Hamadan, Shiraz. They're expensive, yes—but they usually grow in beauty and value as they age, bringing high prices as semi-antiques or "used" rugs. If you like the look but can't go the price—cheer up! Fine American-made rugs in Oriental patterns are now available. They're machine loomed, much less expensive and just as colorful and intricately designed. Remember: Orientals don't show dirt easily and they complement any decor from medieval to tomorrow!

Other varieties include the pale and stately French Aubussons and Savonneries. Once handwoven in France, they can be machine-made today, but still must be specially ordered.

Country-style hooked, braided and rag rugs are also with us in machine-made versions, as a popular do-it-yourself project or in inexpensive handmades imported from the Orient. They're good with early American or any informal decor.

Casual cover-ups blend in well with contemporary surroundings. Tatami mats; hemp squares; matchstick runners; grass, sisal or other fiber rugs; rice paper scrolls—take your pick. Most won't wear as well as the more traditional coverings, but they bring a lot of zing to a room!



Some examples of Oriental rugs (from top to bottom): Tabriz; Shiraz; Kashan; Saruq; Kirman.

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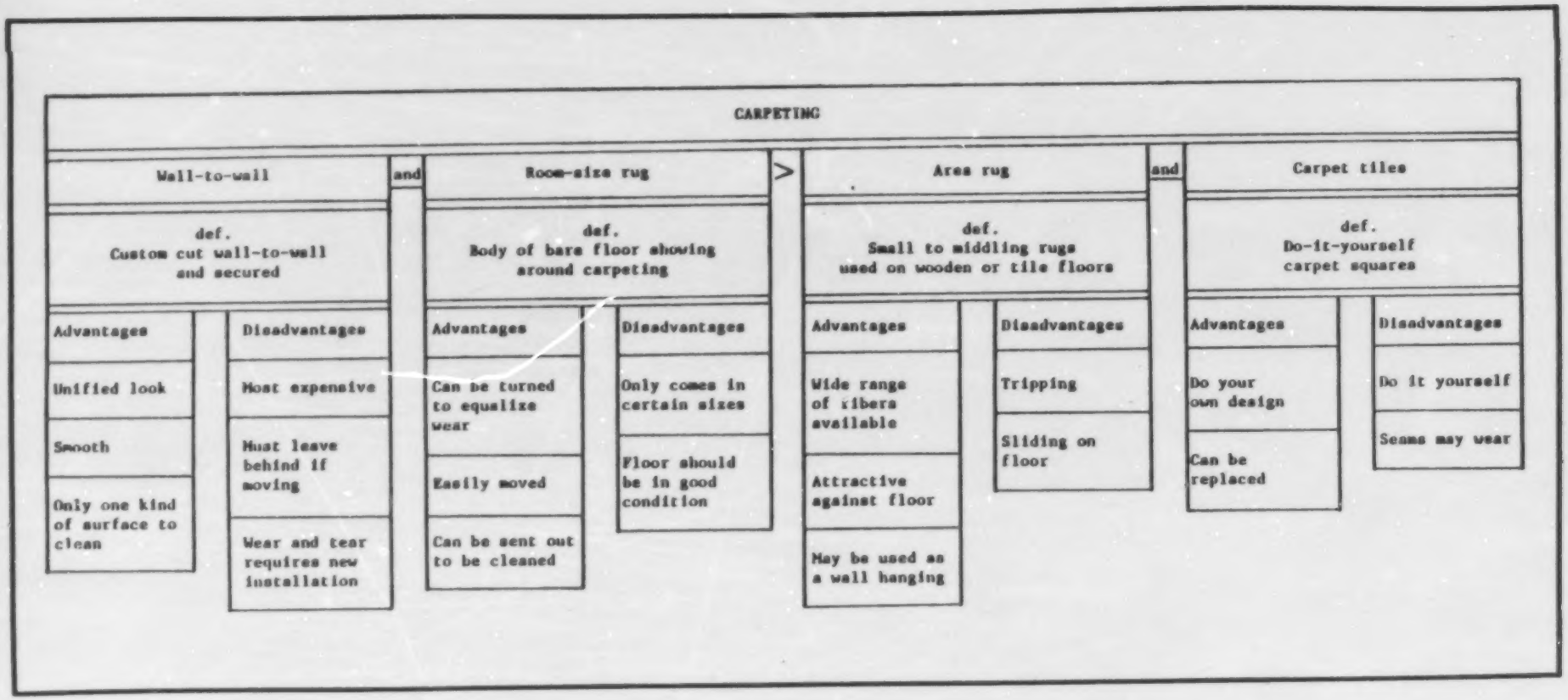


Figure 9. Map of sample text passage (carpets and rugs).

Evaluation of the Mapping Strategy

Appropriate evaluation methods can play a vital role in determining the effectiveness of the mapping strategy. Maps developed during homework assignments may be evaluated according to the correct placement of the information within the map itself. Exams that are developed to assess the effectiveness of the strategy should address questions that directly relate to the information within the map.

Several exam scores recorded over a period of time will assist the instructor in observing increases in recall demonstrated by special needs students. If exams are comprehensive or are developed to measure unit knowledge within a vocational classroom, instructors evaluating the effectiveness of the mapping strategy must specifically review those questions pertaining to information found within the developed maps.

Subjective evaluation concerning student behavior can also provide valuable information about the mapping strategy. The behavioral checklist found in Figure 4 may be used to conduct assessments on classroom behavior.

Conclusions

Many special needs students often find the reading material in regular classrooms too difficult. Yet, the information located within the reading material is important for the student to know. The mapping strategy is one instructional alternative that provides students with an organized method for extracting information from texts or other reading material.

The advantages of the mapping strategy are:

(1) It reduces the length of material presented to the student at one time.

(2) It allows students to relate unfamiliar vocabulary to familiar terms.

(3) It assists students in focusing upon key concepts and important details within the text.

(4) It provides an instructional technique that has been shown to increase recall of text information among mildly handicapped students.

In a vocational classroom it is important that special needs students learn the unique vocabulary and other information presented in text in addition to job skills. As educators, we need to improve upon students' ability to locate useful information, which is a skill that will benefit them for the rest of their lives.

•FLOW CHARTING•

FLOW CHARTING

A Directional Activity

USE OF SYMBOLS AND DIRECTIONAL LINES

Flow charting is another alternative instructional strategy that may be used to increase student achievement in vocational classrooms. It is an instructional technique that sequentially organizes information in a format similar to that used by computer programmers. A flow chart that is developed for classroom use provides a technique for either explaining or analyzing an activity or task.

During the flow charting process, an activity is facilitated by being broken down into small steps that can be followed through to completion. This step-by-step progression is placed within a diagram consisting of a set of symbols and directional lines.

Three symbols utilized in the flow charting strategy are:

1. Ovals (⬭) that start and stop the activity.
2. Rectangles (▭) within which actions are designated.
3. Diamonds (◇) that pose questions and/or require decisions for further action.

These three symbols are connected by arrowed lines denoting directions to assist the student through the sequence of the flow chart. An example of a flow chart is presented in Figure 10 on the following page.

LOGIC AS A BASIS FOR STRUCTURING LESSONS

Flow charting was introduced as an instructional strategy by Project STILE (1979) as a methodology for logically structuring lessons within a classroom. Educational research indicates that sequencing and clustering assist students in integrating and recalling information (Anderson, 1977; Bauer, 1979). Cognitive research discovered that students need explicit feedback concerning strategy use in order for them to monitor its usefulness (Brown & Palincsar, 1982; Spence, 1966).

The ability of students to independently select, sequence, evaluate, and revise or abandon procedures is critical to efficient performance on any task (Butterfield & Belmont, 1975). This process is often referred to as self-monitoring. Hallahan, Marshall, and Lloyd (1981) found self-monitoring effective in increasing attention and on-task behavior among students in classrooms. The utilization of flow charts as an

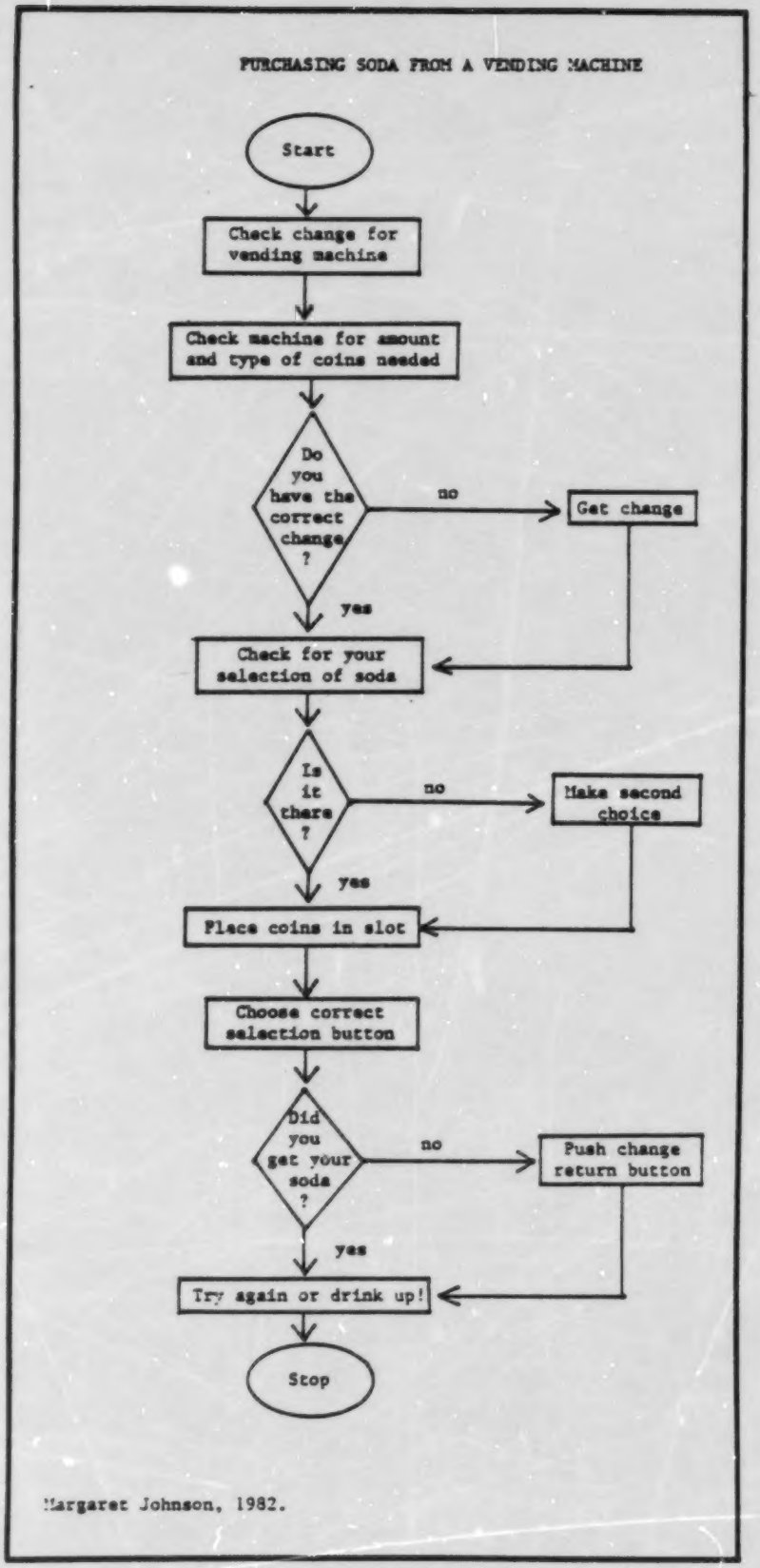


Figure 10. Sample flow chart (purchasing soda from a vending machine).

instructional strategy may increase recall among special needs students, as well as provide students with an opportunity to monitor their own actions.

Implementation of Flow Charting

TRAINING FOR THE FLOW CHARTING STRATEGY

Flow charting is an instructional strategy that requires training and appropriate selection of flow charting activities. The importance of training prior to independent use or individual construction of a flow chart is manifested in the specified rules necessary for flow chart development. It is suggested that these six steps be incorporated in the training procedure:

1. The three symbols utilized within the flow chart (, ,) should be discussed and demonstrated for students.

2. Directional arrows should also be reviewed. Special emphasis should be placed upon arrows originating from questions within the flow chart when the question is answered "no."

3. The teacher should direct the students in the development of a class flow chart on the chalkboard following discussions of the symbols and directional arrows.

4. It is recommended that each student receiving training for flow charting have the opportunity to individually develop a flow chart. This training step may be completed through the use of assigned topics, or students may be permitted to select their own topics.

5. Another teacher-developed flow chart should be presented to students along with a review quiz that addresses the procedure analyzed within the flow chart. This training step will assist teachers in evaluating student proficiency in the "reading" of previously developed flow charts.

6. It is also suggested that teachers develop some type of posttest for flow charting development, which will assist them in evaluating a student's ability to construct a flow chart.

During field testing of the flow charting strategy, it was observed that students quickly mastered the concepts of the symbols and directional arrows incorporated within the flow charting process. A majority of the participants in flow charting training completed the training with

80-100% accuracy within two class periods.

However, when students independently developed flow charts, few students answered the questions within the flow chart with "no" and therefure avoided the necessity of developing the lateral rectangles. This resulted in a very basic sequenced activity. Most students automatically assumed or hoped that no problems would arise during the procedure they chose to flow chart. Since this process is a very important aspect of the flow charting technique, it would be wise for teachers to set a maximum of "yes" answers that may be used in an independently developed flow chart during training.

SELECTION OF ACTIVITIES FOR FLOW CHARTING

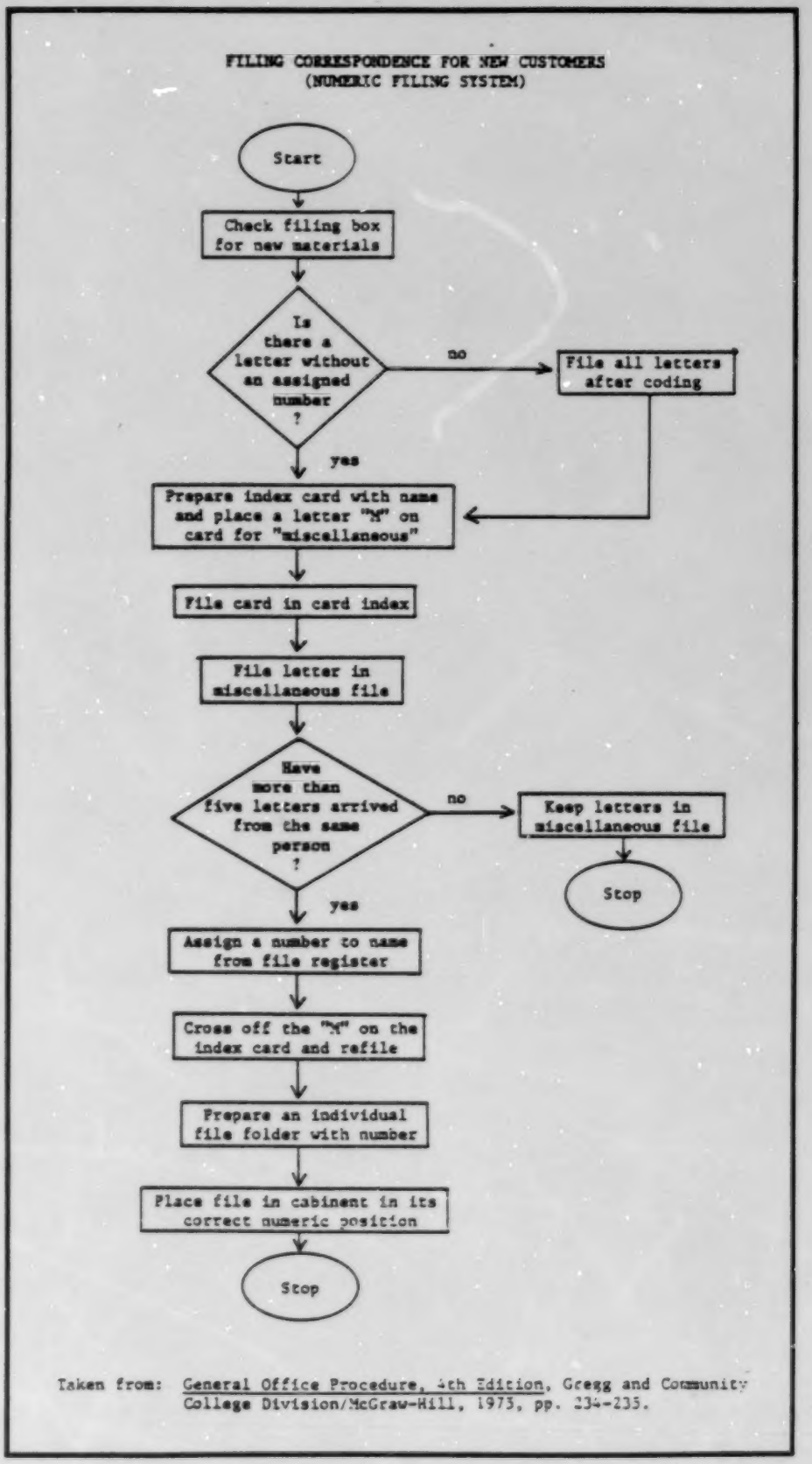
Flow charting is probably best utilized in vocational classrooms during classroom activities. This strategy combines both task analysis and self-monitoring information for special needs students. Teacher-developed flow charts can assist the special needs student by providing a step-by-step set of instructions and may decrease the need for teacher intervention or monitoring during activities. Students may also be asked to develop flow charts during classroom activities for study purposes or as a method of evaluation of student knowledge of the assigned task or activity.

Flow charting may also be utilized in conjunction with some text assignments for the purpose of organizing sequential information presented in texts. Vocational texts often outline specific procedures for preparation of a task, maintenance checks, demonstration of a skill, or repair processes. Sections or subheadings of textbook chapters may also be represented in a sequential format utilizing the flow charting strategy. Two examples for utilizing flow charting with classroom texts are presented in Figures 11 and 12.

During field testing of flow charting within a vocational classroom, the students benefited from the use of this instructional strategy during classroom activities. The use of the flow charting strategy with textbooks required a longer training period, but appeared to be a successful methodology for getting students to interact with the classroom text.

Evaluation of Flow Charting

It is very important that special needs students utilizing flow charting have knowledge of the symbols and organization incorporated in the strategy. The use of a post-training evaluation will assist teachers in identifying those students ready to use the instructional strategy within the vocational classroom. An example of a flow chart strategy evaluation is presented in Figure 13.


FILING CORRESPONDENCE FOR NEW CUSTOMERS
(NUMERIC FILING SYSTEM)
Start
Check filing box for new materials
Is there a letter without an assigned number ?
no
File all letters after coding
yes
Prepare index card with name and place a letter "M" on card for "miscellaneous"
File card in card index
File letter in miscellaneous file
Have more than five letters arrived from the same person ?
no
Keep letters in miscellaneous file
Stop
yes
Assign a number to name from file register
Cross off the "M" on the index card and refile
Prepare an individual file folder with number
Place file in cabinent in its correct numeric position
Stop

Taken from: General Office Procedure, 4th Edition, Gregg and Community College Division/McGraw-Hill, 1973, pp. 234-235.

Figure 11. Flow chart based on text passage (filing correspondence).

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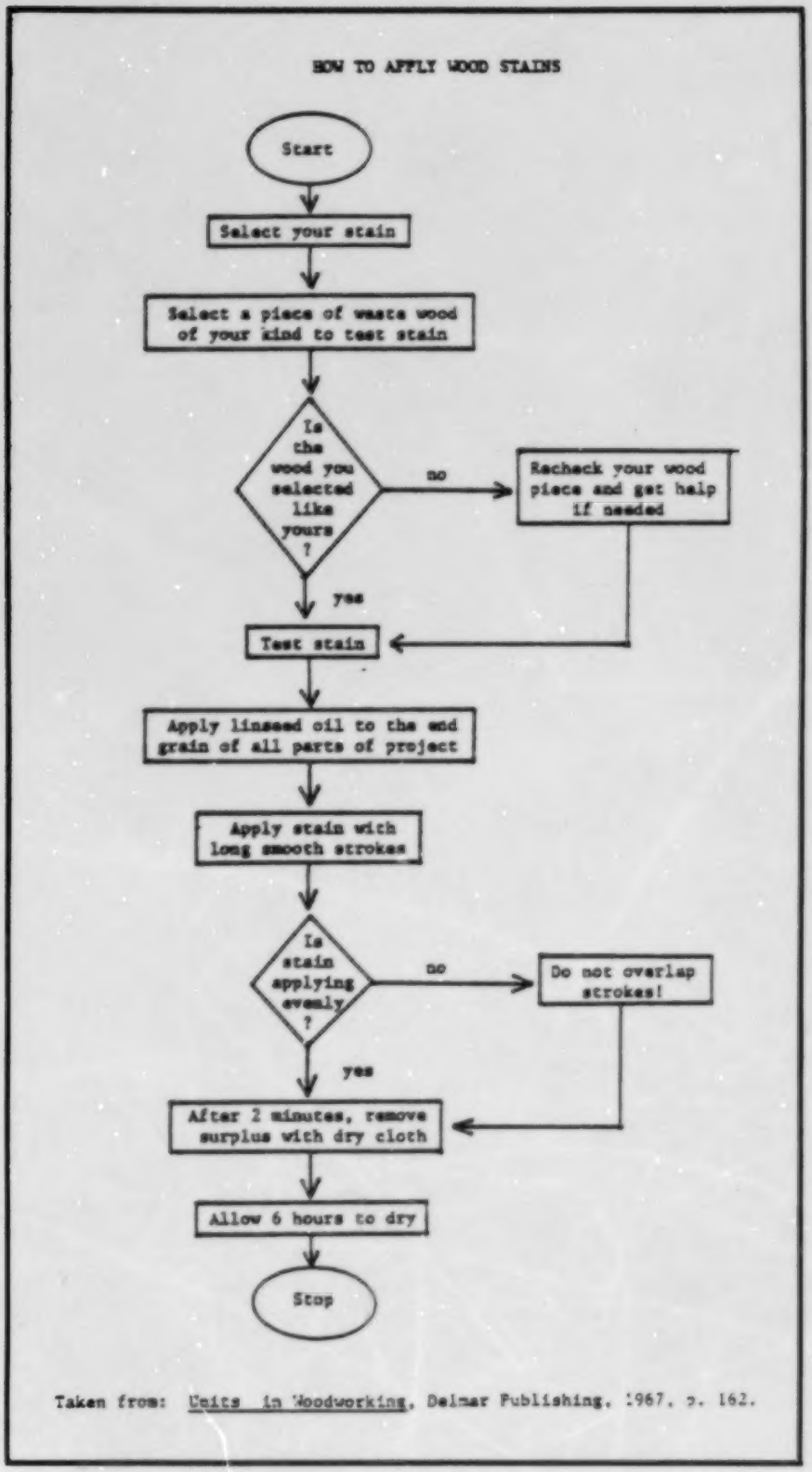

HOW TO APPLY WOOD STAINS
Start
Select your stain
Select a piece of waste wood of your kind to test stain
Is the wood you selected like yours ?
no
Recheck your wood piece and get help if needed
yes
Test stain
Apply linseed oil to the end grain of all parts of project
Apply stain with long smooth strokes
Is stain applying evenly ?
no
Do not overlap strokes!
yes
After 2 minutes, remove surplus with dry cloth
Allow 6 hours to dry
Stop
Taken from: Units in Woodworking, Delmar Publishing, 1967, p. 162.

Figure 12. Flow chart based on text passage (applying wood stains).

BEST COPY AVAILABLE

FLOW CHART TRAINING EVALUATION

Student Name_____

Class_____

Date_____

1. Knows symbols _____%

2. Understands directional arrows _____%

3. Can draw a simple flow chart Yes_____ No_____

4. Can follow an 8-step flow chart (quiz score) _____%

Figure 13. Example of a flow chart training evaluation form.

Following implementation of flow charting within a vocational classroom, evaluation is still a necessary procedure to assist teachers in monitoring student progress. Measures concerning the time required to complete an activity during class, number of completed assignments, or increases in test scores can be related to knowledge of a task. Observations concerning classroom behavior may also be noted on the Student Behavior Checklist (Figure 4).

Conclusions

Flow charting is an instructional strategy that may be used to develop guidelines for classroom activities or to organize textbook information. It provides structured lessons through the use of a sequential diagram. In addition, flow charting seeks to initiate self-monitoring among special needs students.

There are several advantages for both instructors and students when flow charting is implemented within the vocational classroom:

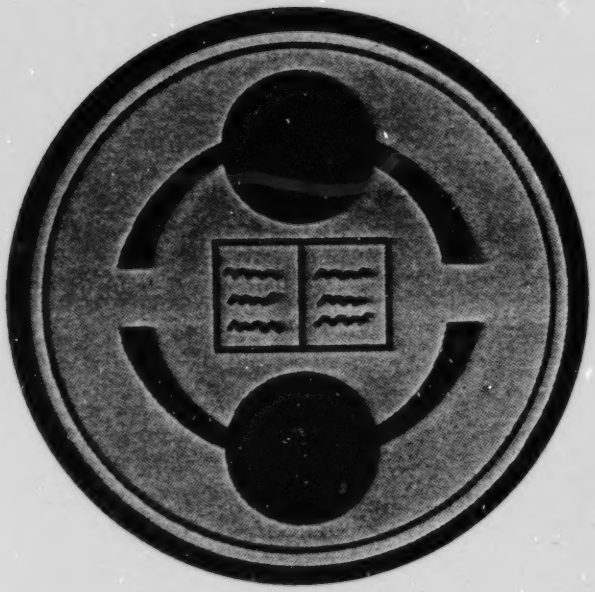
(1) It assists the instructor in planning daily lessons and activities.

(2) It provides special needs students with clear and concise directions and information.

(3) It facilitates individualization of classroom materials through the process of increasing or decreasing the number of steps necessary to complete the activity.

(4) It results in charts that are reusable teaching aides and that can be enlarged for classroom display to assist all students within the vocational classroom.

The large number of students enrolled in regular vocational classrooms can make it difficult for the instructor to provide one-on-one instruction for special needs students during classroom activities. Flow charting is an alternative method for providing individual assistance to special needs students by providing them with a procedure for self-monitoring their actions.



• PEER TUTORING •

PEER TUTORING

Teaching One-On-One

INTERACTIVE INSTRUCTION

Efforts to individualize instruction with special needs students often result in private seatwork with programmed workbooks. This instructional practice reduces actual instruction time. Educational research indicates that a decrease in interactive instruction affects academic achievement among students (Jenkins & Jenkins, 1981). An alternative instructional strategy that can assist teachers in individualizing instruction and can also increase interactive instruction time is peer tutoring.

Peer tutoring is an instructional strategy that utilizes a valuable resource within the classroom ... the student. It prepares qualified students to supplement instruction under the teacher's supervision. It is a practical method of instruction that works with any age group, ability level, or content area (Frick, 1980). Peer tutoring has achieved popularity among educators because it assists them in individualizing instruction without greatly increasing their work load (Asselin & Vasa, 1981).

GAINS IN ACADEMIC ACHIEVEMENT AND PERSONAL GROWTH

Research indicates that peer tutoring has much to offer as an alternative instructional strategy. Tutoring programs have demonstrated improved academic performance of both the tutee and tutor (Gartner, Kohler, & Reissman, 1971; Morgan & Toy, 1970; Slavin, 1980). Peer tutoring has also resulted in improved attitudes and has contributed to the personal and social growth of students. Jones (1974) observed improved attitudes toward school when peer tutoring was implemented within a classroom. Symula (1975) noted an increase in personal confidence among tutored students. The results of this educational research supports implementing peer tutoring within the classroom. Peer tutoring may be viewed as an instructional strategy that promotes achievement through cooperation and interaction between students. Figure 14 summarizes the benefits of tutoring.

COST EFFECTIVENESS

Another consideration in the implementation of a peer tutoring program is its cost effectiveness. A group of special educators in Vermont conducted a study that compared paraprofessional tutors and peer tutors (Armstrong, Conlon, Pierson, & Stahlbrand, 1979). Both groups were equally effective in improving academic achievement. However, expenses

BENEFITS OF PEER TUTORING

Benefits to the Tutor

* Develops cooperation among students
* Develops responsibility
* Develops confidence in own abilities
* Increases interaction with instructors
* Increases academic achievement

Benefits to the Tutee

* Improves attitudes toward school
* Improves academic achievement
* Provides opportunities for success
* Encourages interaction with peers
* Meets individual needs

Benefits to the Teacher

* Provides more instruction time in the classroom
* Provides leadership opportunities for students
* Allows for individualization of instruction
* Increases interaction with students

(Asselin & Vasa, 1981)

Figure 14. Benefits of peer tutoring.

for the paraprofessionals were three times greater than those for the peer tutors.

Developing an Effective Peer Tutoring Program

MAJOR INSTRUCTIONAL DECISIONS OF WHO TO TEACH, WHAT TO TEACH, AND HOW TO TEACH ARE STILL THE RESPONSIBILITY OF THE TEACHER DURING A PEER TUTORING PROGRAM (Jenkins & Jenkins, 1981). The responsibility for providing students with an appropriate instructional program is not diminished with implementation of a peer tutoring program. Lessons utilized during peer tutoring are most effective when they are developed by the classroom teacher and when they parallel current classroom material. The manner of presentation of material during peer tutoring is equally significant in effective tutoring. Therefore, peer tutors must possess specific personal characteristics and must be adequately prepared in instructional techniques.

SELECTION OF PEER TUTORS AND PAIRING THEM WITH STUDENTS

Tutors may be selected by asking for volunteers or by utilizing teacher recommendations. Vocational organizations such as DECA, HERO, and FFA can also provide peer tutors. However, there is more to consider in the selection process than the prospective tutor's academic ability level. Other crucial factors in tutor selection relate to the tutor's personal characteristics. Various criteria for selection of peer tutors include achievement, responsibility, completion of assignments, good social skills, dependability, and sensitivity (Jenkins & Jenkins, 1981).

The following is a sample of personal characteristics that may serve a criteria in selecting peer tutors:

(1) Exhibits a positive attitude

(2) Is cooperative

(3) Is responsible

(4) Completes assignments

(5) Is a good role model

(6) Demonstrates knowledge about content area

(7) Follows directions

(8) Is accurate

(9) Is honest

(10) Shows respect for others

(11) Practices good communication skills

(12) Has proven record of achievement

Another important consideration in implementing peer tutoring is the pairing of tutors with learners. Teachers may need to consider factors related to age differences, along with the racial, socioeconomic, and sexual composition of pairs (Jenkins & Jenkins, 1981). Research concerning pairing of tutors and tutees has been sparse. Klentschy (1971) found no relation between achievement gains and sex pairings. Witte (1972) indicated that various racial pairings had no significant influence on learning, but did positively influence attitudinal changes. Research on the age differential has produced conflicting evidence. However, Allen and Feldman (1975) found that compared to adults, children were better able to discriminate another person's level of understanding using nonverbal cues alone. It appears that the consensus among researchers at this time is that teacher judgment is the best basis for selection of appropriate tutors (Asselin & Vasa, 1981).

TUTOR TRAINING

Training tutors in specific tutoring skills can contribute to an effective tutoring program. A review of tutor training programs in the literature indicates the need for skills training in measurement, reinforcement, observation, and responsibility (Allen & Boraks, 1978; Harrison, 1978). Other important components of a training program may include knowledge of program procedures, operation of audiovisual and office machines, and development of supervisory skills (Asselin & Vasa, 1981).

Effective tutor training sessions should make maximum use of activity-oriented instruction. Structured activities utilizing demonstration, manipulation of materials, games, and brainstorming procedures should be emphasized to encourage tutor-tutee interaction during tutoring.

The specific content of tutor training programs will vary with the subject area and the types of students to be tutored. This is an important concern of vocational educators who provide vocational training in specific content areas. However, establishing general guidelines for tutor training can facilitate the effectiveness of the tutor training process.

IMPLEMENTING TUTOR TRAINING

Arrangements must be made with the school administration to provide for tutor training programs. Training programs may be conducted at the beginning of the school year or during the summer interim. Responsibilities for these training programs should be established and

the necessary personnel identified to provide specific training activities, such as in the audiovisual area. It may also be necessary to schedule meetings during the school year to obtain feedback from tutors and teachers in order to establish further guidelines or to institute modifications in the training program.

Implementing Peer Tutoring in the Classroom

INFORMING PARENTS ABOUT THE TUTORING PROGRAM

The parents of both the tutor and tutee need to be informed of the tutoring program and the proposed involvement of their son or daughter. A letter to the parents may provide the necessary information about the tutoring program and also secure their approval. The building principal should approve the letters and be informed of individuals involved in the tutoring program. A sample letter to the parents of a selected tutor is presented in Figure 15.

DETERMINING A TIME FOR TUTORING

Classroom teachers generally prefer to set a specific time for tutoring, either during class or at another time during the day. Within-class tutoring is usually left to the discretion of the classroom teacher. Out-of-class tutoring involves coordinated scheduling of both the tutor and tutee. It may be wise to consult the school counselor if arrangements for out-of-class tutoring are a problem. Teachers should avoid scheduling tutoring during lunch or after school. These are the least desirable tutoring times and may decrease the effectiveness of the tutoring.

Research on tutoring suggests that sessions approximately one-half hour in length are best and that daily lessons are preferred over less frequent scheduling (Ellson, Harris, & Barber, 1976; Jenkins, Mayhall, Peschka, & Townsend, 1974). Vocational educators may utilize peer tutoring by including both within-class tutoring and out-of-class tutoring sessions. Within-class tutoring may be emphasized during labs, and out-of-class tutoring may accompany lecture and text assignments.

DESIGNING LESSONS FOR PEER TUTORING

Peer tutors are students and not trained instructors. Data on the effects of unstructured programs indicate the dangers of delegating too many decisions to student tutors (Foster, 1972; Kelly, 1972). Research has also shown that the content of tutoring lessons should be closely aligned with the learner's regular classroom program (Jenkins & Jenkins, 1981). Therefore, IT IS IMPERATIVE THAT LESSONS BE STRUCTURED BY THE TEACHER AND BE RELATED TO CURRENT CLASSROOM ACTIVITY.

November 5, 1984

Dear _____:

Your son/daughter has been recommended by _____ to be a student tutor at Anytown High School. His/her teacher believes that _____ has demonstrated the academic success, patience, and maturity needed to assist another student.

Students recommended as tutors will participate in a two-week training program. They will be instructed in basic techniques for assisting their tutees.

The training and management of the tutoring program will be under constant supervision. A quarterly report of your child's tutoring experiences will be sent to you. It is also understood by the principal and classroom teachers that your son/daughter will maintain his/her high academic achievement and exemplary social behavior in order to continue in the tutoring program. Parents are invited to visit the tutoring program at any time.

If you have any questions, please call me at Anytown High School.

Sincerely,

Linda Jenkins
Business & Office Teacher

* * * * * * * * * * * * * * * * * *

Yes, _____ has my permission to participate in the tutoring program at Anytown High School.

_____
Parent Signature

(Taken from Jenkins & Jenkins, 1981)

Figure 15. Sample letter to parents of a peer tutor.

Tutors may supplement instruction by performing some of the following activities under the supervision of the classroom teacher (Asselin & Vasa, 1981):

(1) Review lessons

(2) Demonstrate skills

(3) Assist in giving tests

(4) Read material to students

(5) Clarify instructions

(6) Provide remedial lessons through direct questioning or teacher-organized assignments

(7) Provide feedback and reinforcement

(8) Supervise tutees on new skills

(9) Develop educational games

(10) Complete observational evaluations

Utilizing the various techniques included in tutor training, teachers may develop lesson plans that will provide tutors with appropriate content and techniques to facilitate peer tutoring. A sample lesson for tutoring in a Home Economics is show in Figure 16.

MAINTAINING THE TUTOR'S INVOLVEMENT AND INTEREST

Like teaching, tutoring is not an easy task. Although the satisfaction that comes with having helped another person may be sufficient to maintain the efforts of some tutors some of the time, it may be necessary to reward tutors in other ways. Reports, letters, and newspaper articles that draw attention to accomplishments are effective methods of demonstrating appreciation. Awards may also be presented at organizational luncheons and banquets sponsored by vocational youth groups.

Evaluation of the Tutored Lesson

Teachers need to incorporate an adequate measure of performance for each lesson during peer tutoring. The sample lesson presented in Figure 16 includes specific measures for each task along with a pretest and posttest of the overall objectives. Scores for these measures may be

SAMPLE LESSON FOR PEER TUTORING

Instructional Objective: The student will identify commonly used labels and their abbreviations, which include different units of weights and measures.

Instructional Objective: The student will match labels and abbreviations with their respective quantities.

Materials:

1. 3" x 5" cards with labels and abbreviations written on them.
2. Containers or cooking instruments that represent the weights and measures specified.
3. Scoresheet.

Activities:

1. Shuffle the 3" x 5" cards including both labels and abbreviations. Present these as flashcards. Record the correct and incorrect responses on your scoresheet. Also list the labels and abbreviations that were incorrectly identified.
2. Review the incorrect responses.
3. Play a game of concentration to match labels and abbreviations.
4. Place the containers and cooking instruments on the counter. Instruct your tutee to put the label cards next to the appropriate container or instrument. Record the correct and incorrect responses on the scoresheet. Please list the names of the incorrect responses.
5. Remove the label cards and repeat the activity with the abbreviation cards. Record responses and list incorrect abbreviations.
6. Repeat the flashcard activity and record the new score alongside the first score.

Comments and Suggestions:

(Please note that this lesson requires interaction between the tutor and learner.)

Figure 16. Sample lesson for peer tutoring.

recorded on daily scoresheets, such as the one shown in Figure 17.

Charts and graphs, such as the one shown in Figure 18, are effective methods for indicating progress to special needs students. Verbal reinforcement for correct responses should also accompany scoresheets and graphic evaluations. In addition to monitoring classroom achievement, information gathered during these evaluations may be used to revise the tutor's responsibilities, modify the lesson, direct the individual tutoring program, and evaluate the overall effectiveness of the tutoring program,. Evaluations may also be conducted weekly or monthly on specific classroom behaviors, as well as on the tutor-tutee interactions during the tutoring sessions.

Conclusions

The development of a peer tutoring program involves three organizational plans. These organizational plans include preparation for peer tutoring, implementation of peer tutoring, and evaluation of peer tutoring. Each organizational plan is necessary to provide a firm foundation for the peer tutoring program. Figure 19 represents the organizational plan for conducting a peer tutoring program.

A well-organized tutoring program can assist vocational educators in producing academic gains and improving social skills among special needs students. Peer tutoring encourages advocacy among peers and also provides instructors with an alternative technique for individualizing classroom materials. Cooperative tutor training programs developed by both vocational and special educators can assist special needs students who have been integrated into regular vocational classrooms.

Tutor's Scoresheet

Pretest (flashcards) Correct____ Incorrect____

Specific incorrect responses:

Matching labels and containers Correct____ Incorrect____

Specific incorrect responses:

Abbreviation cards and containers Correct____ Incorrect____

Specific incorrect responses:

Posttest (repeat flashcards) Correct____ Incorrect____

Specific incorrect responses:

Figure 17. Tutor's scoresheet for a peer tutored lesson.

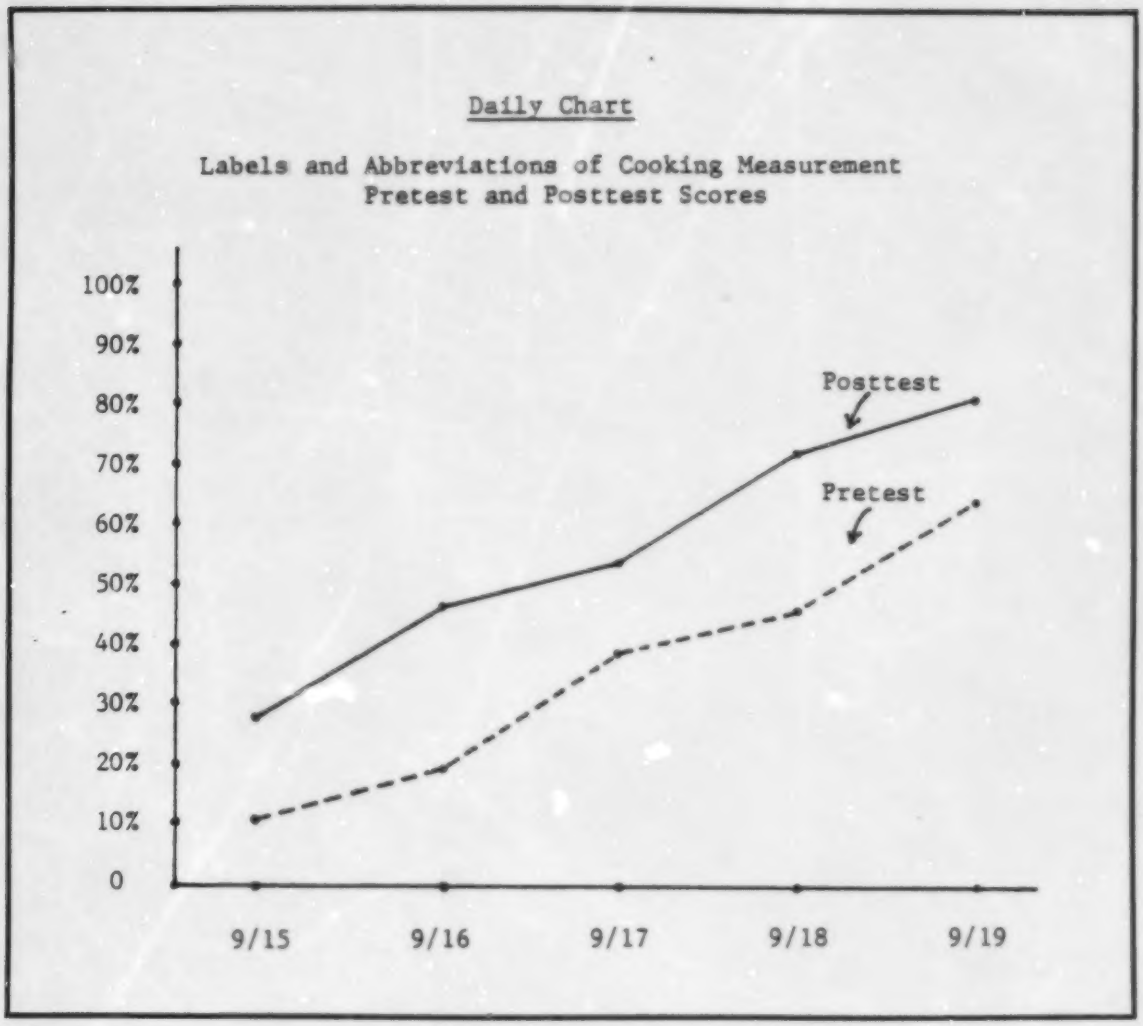


Figure 18. Sample graph of scores from peer tutored lessons.

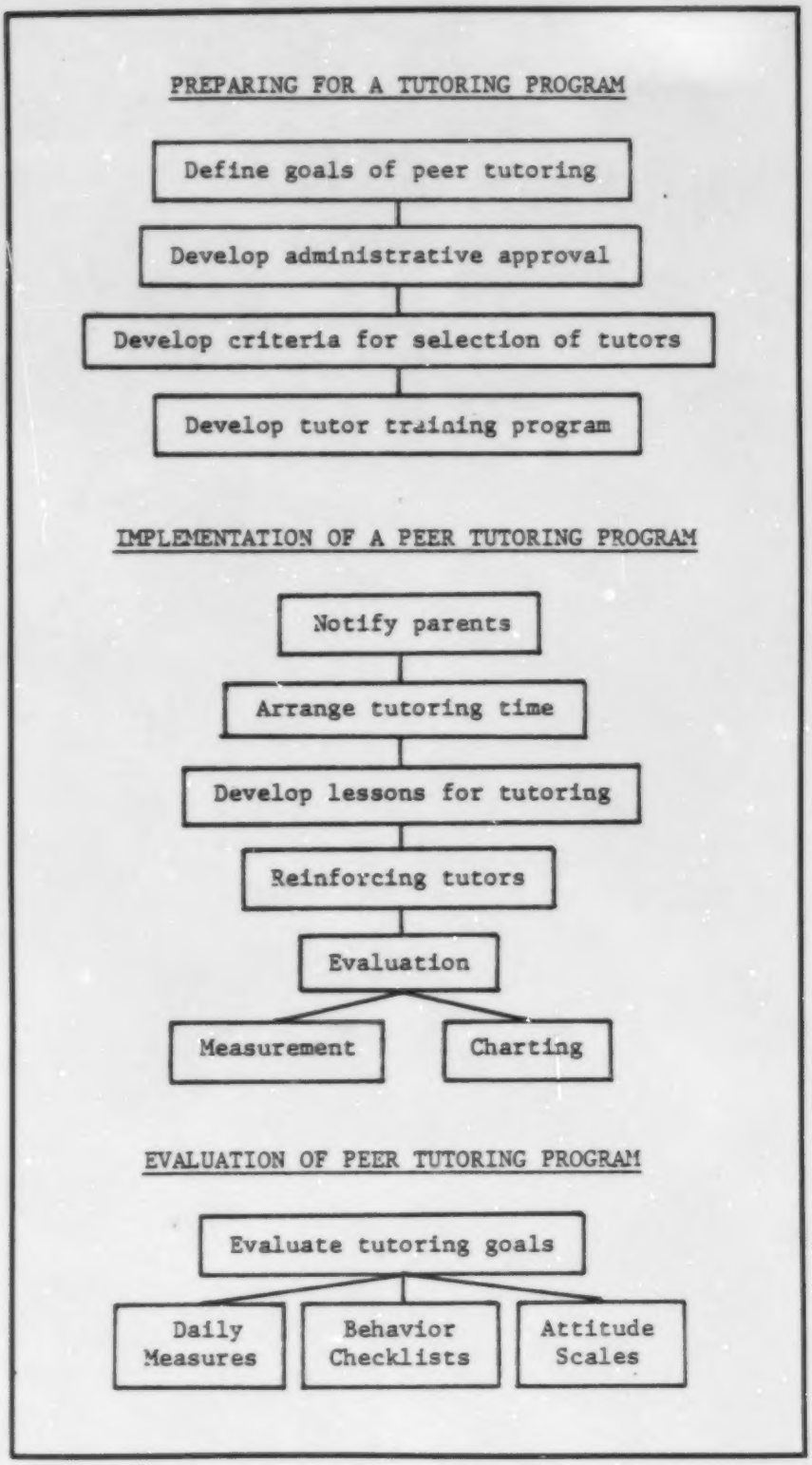


Figure 19. Organization plan for conducting a peer tutoring program.

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